Meeting Skill Requirements

Report of the human resources survey

Gordon Betcherman

A study prepared for the
Economic Council of Canada

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Available in Canada through

Authorized Bookstore Agents
and other bookstores

or by mail from

Canadian Government Publishing Centre
Supply and Services Canada
Ottawa, Canada, K1A 0S9

Catalogue No. EC 22-100/1982E
ISBN 0-660-11066-0

Canada: $6.95
Other countries: $8.35

Price subject to change without notice

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Preface

In late 1979, the Economic Council of Canada carried out an inquiry focusing on the manpower problems and programs of employers in this country. The major findings of this inquiry – the Human Resources Survey (HRS) – were published in a summary guide, *Skills and Shortages*, which was released in September 1980. Now, in this second report, the results of the Survey are presented in some detail. The information and analysis offered in this study are intended to contribute to the understanding of human resource problems, which are of considerable concern to governments, educational institutions, unions, employers, and employees.

The Human Resources Survey operates within the Economic Council's Labour Markets Project, and further analysis of the results will appear in forthcoming documents emanating from that group.

Part 1

Introduction

1 An Overview

Prelude

The development of vocational skills is a significant feature of any country's social and economic reality. From a collective standpoint, human resources constitute a critical factor in the production of goods and services. The volume and nature of this production, of course, dictate the level of a society's material prosperity. For the individual, skills play a major role in determining labour market experiences, which, in turn, strongly affect one's psychological and financial well-being.

In recent years, it has become increasingly apparent that Canada is experiencing difficulty with respect to its vocational skills. Since the late 1970s, a growing number of businesses have reported job vacancies that could not be filled because of a lack of people with certain occupational abilities. This evidence has been particularly disturbing in light of the persistently high rates of joblessness that have characterized the Canadian labour market.

Certainly, the matching of people and jobs in an advanced industrial state is an extremely complex task. Nevertheless, the apparent magnitude of these shortages within the context of high unemployment is a troublesome paradox indeed. Not surprisingly, this situation has raised many doubts about the operating efficiency of the Canadian labour market. In particular, attention is being focused on our ability – or, rather, inability – to generate the vocational skills required by the economy. Accordingly, the existing arrangements for education, training, forecasting, mobility, and immigration must inevitably come under critical examination.[1]

Despite the crucial nature of these problems, great gaps have existed in our knowledge of where the most serious imbalances are and what we can do about them. In response to this situation, the Economic Council of Canada recently undertook a nationwide project focusing on the manpower problems and programs of employers in this country. This effort – the Human Resources Survey, (HRS) – was designed to gather information on the experience of industry in meeting its skill requirements.

The aim of the Survey was essentially twofold: first, to outline the dimensions of the shortages; and, second, to address the strategies used by establishments to ensure availability of the skills they need. In both of these areas, major shortcomings have existed with respect to the information available. Job vacancy data are not collected in any comprehensive fashion in this country; accordingly, identification of the imbalances has been problematic.[2] In addition, there is surprisingly little known about manpower programs within the private sector and, in particular, about the vocational training effort in industry.[3]

The Human Resources Survey, then, represents an attempt to address these information gaps at a time when they are of particular significance. This effort, of course, cannot take the place of regular and comprehensive labour market data collected at the establishment level.[4]

Outline of the Report

The results of the Human Resources Survey are presented, in some detail, in this report.[5] It is divided into four parts. This introductory section concludes with Chapter 2, wherein various aspects of the Survey's design and methodology are briefly described. In addition, the characteristics of the HRS sample and its representativeness are discussed.

In Part 2, the Survey's findings on skill shortages (those experienced and those anticipated) are presented. Chapter 3 discusses the prevalence of hiring difficulties and analyses the variation in the incidence of shortages with respect to geographical location, industrial sector, and certain organizational characteristics. In Chapter 4, we turn to those particular skills which are in short supply. After the national picture is presented, we focus on the specific problems experienced by the different regions and industries. Chapter 5 deals with the responses of establishments when faced with hiring difficulties. In such situations, there are a number of alternative

strategies available, and the importance of each is discussed.

In Part 3, we look at the human resource programs in industry. Essentially, establishments can meet their ongoing personnel requirements by either buying skills or developing them. The former method is the subject of Chapter 6, which examines the employer search patterns of the Survey's respondents. The importance of the local market, other parts of Canada, and offshore sources are discussed. Chapter 7 considers the programs for developing skilled workers in industry. Following a review of the incidence of vocational training within the HRS sample, details of the programs are presented. Included in the description are the types of skills developed; the duration, method, and cost of the programs; and the role of government.

In the final section of the report, conclusions are drawn from the Survey results. This includes a discussion in Chapter 9 of the research and policy implications that have emerged from the findings of the project.

2 The Human Resources Survey

As mentioned in the introduction, the Human Resources Survey was developed to obtain information on Canadian experience in meeting skill requirements. The HRS was designed as a mailed establishment survey, which would seem to be the single most effective and expedient means of addressing the issues of interest. There are some difficulties, however, with such an approach. In the first place, one is limited by a lack of personal contact. Thus, once an optimal "package" of questions has been formulated, little room exists for the accommodation of alternative perspectives or the consideration of other pertinent concerns. And, of course, the usual biases associated with "non-response" must be recognized.

Specific to the HRS are problems related to the sample – or, more precisely, exclusions from the sample. By surveying only established organizations, the experiences with personnel in new firms have not been incorporated. Also, an establishment inquiry, by its very nature, places only marginal attention on unions, educational institutions, and other actors important in the manpower field.

Survey Methodology

The Questionnaire

The data were collected by means of a questionnaire that had been mailed with a covering letter to the sample establishments in October 1979. Those companies which had not responded by early December were once again sent the questionnaire, along with a follow-up letter. In all cases, the communication was addressed to the "Director of Personnel." Copies of the Survey instrument, the initial covering letter, and the follow-up letter are reproduced in Appendix A.

The questionnaire is divided into three major sections.[1] The first, "Skill Shortages," centres on both past and anticipated hiring difficulties. For each shortage situation, the respondent was asked to identify the job title, the time of the difficulty, and the number of employees required. Of course, the information on anticipated hiring difficulties stems from expectations rather than experience. In the case of past shortages, the respondent was asked to identify what the company had done in response to the problem.

The second section, "Meeting Skill Requirements," focuses on the human resource programs in industry. The emphasis is on vocational training – how much is carried out, the types of programs, the costs, the deterrents, and the role of government. Other questions in this section address the patterns of employee search and the extent of formal personnel forecasting.

The final section, "Background Information," elicits data on various organizational characteristics. Included are questions on establishment age, size, wages and salaries, turnover, unionization, and financial resources. This information, of course, is useful in the analysis of an organization's labour market experiences.

Sample Design

An appropriately designed sample, of course, must reflect the objectives of the data collection project. In the case of the Human Resources Survey, the consummate goal was to obtain information on the personnel problems and programs characterizing employers in this country. This aim, then, suggested the need for a strategy that could produce a sample of industrial organizations representative of the Canadian economy. In addition, given the focus on hiring difficulties and skill requirements, the most relevant unit of sampling appeared to be the establishment rather than the company.[2]

On the basis of these specifications, the establishment list, compiled by Dun and Bradstreet Canada Ltd. (Marketing Services Division), was selected as the population from which our survey sample would be drawn. With close to half a million organizations, the Dun and Bradstreet listing represents a comprehensive (albeit not complete) inventory of Canadian establishments. In addition, each record includes the establishment mailing address, thereby enabling us to

direct the questionnaire to the targeted individual (i.e. the personnel head) in each selected establishment.

For the purposes of the Human Resources Survey, the Dun and Bradstreet listing was slightly modified. The alterations consisted of the following exclusions: first, organizations in agriculture, forestry, fishing, and public administration; and, second, those establishments classified as employing less than 20 people.[3] With these criteria in place, the sample was randomly drawn from the Dun and Bradstreet inventory.

The Survey Sample

Rate of Response

On the basis of this selection procedure, questionnaires were sent to 4,012 establishments.[4] Acceptable returns were received from 1,354, or 33.7 per cent, of those firms. The rate of response, by region and province, is shown in Table 2-1. It is obvious that the degree of co-operation was very consistent across the country. All of the regions closely approximated the national response rate; and, provincially, only Newfoundland and the Territories deviated noticeably. In these cases, of course, the relatively low numbers involved cannot be ignored.

Table 2-1

Rate of Response to Human Resources Survey, by Region and Province, 1979

	Number of mailings	Number of returns	Rate of response
			(Per cent)
Atlantic region	257	90	35.0
Newfoundland	49	25	51.0
Prince Edward Island	14	5	35.7
Nova Scotia	106	31	29.2
New Brunswick	88	29	33.0
Quebec	1,091	363	33.3
Ontario	1,557	538	34.6
The West	1,107	363	32.8
Manitoba	163	56	34.4
Saskatchewan	110	35	31.8
Alberta	410	136	33.2
British Columbia	413	128	31.0
The Territories	11	8	72.7
Canada	4,012	1,354	33.7

Sample Description

The usefulness of the findings of a survey depends, in large part, upon the representativeness of the sample. In other words, how closely do the respondents, as a group, reflect the characteristics of the relevant universe? This question is addressed in the following discussion, which summarily compares the Survey sample with Canadian establishments in general.

Before beginning this exercise a few remarks are perhaps necessary. First, the similarity of the Survey respondents to the Canadian private sector is immediately limited by the industry and size exclusions imposed at our sampling stage. Second, the information used here to represent Canadian establishments, as a whole, does so only partially. The source for these data is the inventory of firms used for Statistics Canada's Larger Firm Survey (October 1979), which admittedly has limitations in its coverage of the Canadian private sector. Foremost among these is the disproportionately low sampling rate of establishments with fewer than 20 employees.[5] The following remarks, then, essentially pertain to the extent to which the Human Resources Survey sample reflects the "larger firm" portion of the Canadian private sector.

As Table 2-2 indicates, the geographical distribution of the HRS establishments closely resembles that of the Larger Firm Survey. Moreover, from Table 2-3 it can be seen that the similarities extend into the industry division breakdown, where no differences seem too significant. The minor biases that do exist are in manufacturing, which is marginally overrepresented in the HRS sample, and in finance, insurance, and real estate, which is slightly underrepresented.

Table 2-2

Distribution of Sample Establishments in the Human Resources Survey and the Larger Firm Survey, by Region and Province, 1979

	Establishments surveyed	
	HRS	Larger Firm Survey
	(Per cent)	
Atlantic region	6.7	8.9
Newfoundland	1.8	1.7
Prince Edward Island	0.4	0.5
Nova Scotia	2.3	3.7
New Brunswick	2.1	3.0
Quebec	26.8	23.9
Ontario	39.7	39.3
The West	26.8	27.9
Manitoba	4.1	4.6
Saskatchewan	2.6	3.4
Alberta	10.0	9.2
British Columbia	9.5	10.4
The Territories	0.6	0.3
Canada	100.0	100.0

Table 2-3

Distribution of Sample Establishments in the Human Resources Survey and the Larger Firm Survey, by Industry, 1979

	Establishments surveyed	
	HRS	Larger Firm Survey
	(Per cent)	
Forestry	–	0.9
Mining	2.1	1.5
Construction	8.1	7.6
Manufacturing	32.6	27.7
Transportation and communication	6.4	7.0
Trade	26.1	28.6
Finance, insurance, and real estate	3.8	7.5
Service	20.9	19.2
All industries	100.0	100.0

A final characteristic to be considered here is organizational size. In comparison with the Statistics Canada companies, our sample is weighted, to some extent, towards larger establishments (Table 2-4). While close to two-thirds of the former group employ fewer than fifty workers, the corresponding figure for the HRS firms is about 56 per cent, the majority of which fall into the 20-49 employee category. Of course, the HRS weighting with respect to size, as depicted in Table 2-4, actually understates the real bias, since the control group itself excludes most very small establishments.

Table 2-4

Distribution of Sample Establishments in the Human Resources Survey and the Larger Firm Survey, by Size of Establishment, 1979

	Establishments surveyed	
	HRS	Larger Firm Survey
	(Per cent)	
Establishment size (number of employees[1]):		
Less than 20	16.8	33.1
20-49	39.8	31.4
50-99	18.6	17.1
100-499	18.9	15.9
500 or more	5.9	2.5
Total	100.0	100.0

1 Full-time only, in the case of HRS; part-time and casual also, in the Larger Firm Survey.

To sum up, then, the collection of firms responding to the Human Resources Survey closely reflects the geographic and industry distributions characterizing Canadian business, as proxied by Statistics Canada's Larger Firm Inventory. In terms of organizational size, however, an analysis of the HRS sample does reveal an overrepresentation of large establishments.

Part 2

Skill Shortages

3 The Incidence of Shortages

The presence of skill shortages has been an intermittent phenomenon in the post-Second World War history of this country. These imbalances have most often occurred in the trades and in the managerial and the scientific and technical occupations.[1] In recent years, there has been a growing body of evidence indicating the re-emergence of skill shortages in Canada. These reports have been based, for the most part, on isolated efforts to identify labour imbalances in specific industries or regions.[2] With national and multi-industry coverage, though, the Human Resources Survey constitutes a relatively more encompassing inquiry into the incidence of skill shortages in this country.

Unfortunately, the wide coverage of the HRS dictates that some detailed breakdowns of the data collected will inevitably have small sub-sample sizes. In these cases, caution must naturally be exercised in interpreting the Survey results.

Before turning to the findings, the difficulties associated with the concept of skill shortages should be noted. The phenomenon, itself, is adequately understood: job vacancies cannot be filled because people with the necessary skills are not available. Problems arise, however, when one has to further clarify the concept in order to measure it. How long must a vacancy exist before it becomes a legitimate shortage? And even if that duration is reached, does the vacancy persist because of a lack of skilled people or because of other factors, such as the quality of the employment package offered? With these and other difficulties in mind, there are essentially two survey strategies that can be used to address shortages. First, one can specifically set out criteria that must be met before a vacancy can be labelled a "shortage." Or, alternatively, a more subjective approach can be employed, whereby the responding organization itself identifies shortages as it perceives them. As is evident from the questionnaire (Part A in Appendix A), the latter method was chosen for the Human Resources Survey. While it lacks rigour and may well result in some overstatement of the phenomenon, this approach avoids the extremely sticky problem of setting up and putting into operation a set of conditions that define a "shortage."

In Table 3-1, the findings of the HRS corroborate earlier evidence pertaining to the presence of shortages. Virtually half of the participating establishments across the country reported that, during the 1977-79 period, they had experienced hiring difficulties because of a lack of qualified personnel; moreover, 43 per cent of the respondents anticipated similar problems in the upcoming five years.

Table 3-1

The Incidence of Hiring Difficulties, Experienced and Anticipated, 1977-79 and 1980-84

	Establishments that experienced or expect difficulties
	(Per cent)
1977-79	49.4
1980-84	43.0

SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

The data presented in Table 3-1, then, would appear to suggest that shortages are expected to diminish slightly in importance in the future. Such an interpretation, however, should not necessarily be accepted. It is perhaps more likely that the lower incidence expected in the upcoming years is the result of some establishments in the sample being uncertain of the future and, therefore, unwilling to "state" that difficulties are anticipated.

These companies notwithstanding, it is a prominent finding of the Survey that establishments that experienced shortages in the past tend, to a marked degree, to be those which also anticipate problems in the future. In fact, 82.7 per cent of the firms that reported hiring difficulties in the 1977-79 period expected similar problems between 1980 and 1984. This theme of "more of the same" will remain evident throughout the ensuing discussion of where the problems lie.

The Geographical Dimension

Regional Shortages

The incidence of shortages varies in different parts of the country. As Table 3-2 indicates, the problems have been greatest in the West, where 62 per cent of the respondents reported hiring difficulties in the 1977-79 period. Furthermore, the Survey results suggest that this region will continue to be the most affected in the upcoming years. Of course, this reflects the rapid economic growth in this region. Establishments in Quebec and the Atlantic region reported the lowest incidence of shortages; the Ontario figures, however, were close to the national average for both periods.

Table 3-2

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	90	42.2	35.6
Quebec	363	38.0	29.5
Ontario	538	49.8	45.4
The West	363	62.0	54.8
Canada	1,354	49.4	43.0

SOURCE HRS, 1979.

Provincial Shortages

The frequency of hiring difficulties in the West was most severe in Alberta. Nearly 77 per cent of the respondents from that province identified shortages during 1977-79, while slightly more than 66 per cent anticipated problems in the future (Table 3-3). After Alberta, the other Prairie provinces (Manitoba and Saskatchewan) reported the greatest incidence of difficulties.

Urban Shortages

Given these regional and provincial patterns, it is not surprising that respondents in Edmonton and Calgary have been, and will continue to be, more affected by shortages than their counterparts in other Canadian cities. Table 3-4 indicates that 82.7 per cent of the Edmonton respondents and 77.8 per cent of those from Calgary experienced hiring difficulties in the 1977-79 period. Moreover, shortages were anticipated during 1980-84 by 75 per cent and 62.2 per cent of the establishments surveyed in

Table 3-3

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Province, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Newfoundland	25	24.0	20.0
Prince Edward Island	5	20.0	-
Nova Scotia	31	51.6	48.4
New Brunswick	29	51.7	41.4
Quebec	363	38.0	29.5
Ontario	538	49.8	45.4
Manitoba	56	64.3	55.4
Saskatchewan	35	57.1	54.3
Alberta	136	76.5	67.7
British Columbia	128	46.9	40.6
The Territories	8	62.5	62.5
Canada	1,354	49.4	43.0

SOURCE HRS, 1979.

Edmonton and Calgary, respectively. Kitchener and Winnipeg also reported relatively high incidences of vacancy-related problems. Least affected were centres in Eastern Canada, particularly Quebec City, Montreal, Ottawa-Hull, and London.

Table 3-4

The Incidence of Hiring Difficulties, Experienced and Anticipated, in Selected Urban Centres,[1] 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Halifax	11	45.5	45.5
Quebec City	32	37.5	34.4
Montreal	183	39.9	31.7
Ottawa-Hull	41	31.7	22.0
Toronto	211	54.5	49.8
Hamilton	34	41.2	41.2
Kitchener	24	66.7	62.5
London	24	29.2	29.2
Winnipeg	40	65.0	50.0
Edmonton	52	82.7	75.0
Calgary	45	77.8	62.2
Vancouver	68	52.9	42.7

1 Classified in accordance with the urban industrial employment area system used by the Employment Section, Labour Division, Statistics Canada.

SOURCE HRS, 1979.

While different labour markets, then, appear to have varying degrees of difficulty, the HRS results

suggest no relationship between the incidence of shortages and the *size* of the labour market. Table 3-5 indicates that the experiences and expectations of respondents in large metropolitan centres do not differ significantly from participating firms in smaller municipalities and rural areas.

Table 3-5

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Population of Establishment Site, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Population of establishment site:[1]			
500,000 or more	661	50.2	43.1
100,000 - 499,999	207	51.2	45.4
20,000 - 99,999	187	47.1	40.1
Less than 20,000	288	47.6	42.4
All establishments[2]	1,343	49.4	43.0

1 As obtained from the 1976 Census (Bulletins 92-809 and 92-810).
2 Except for 11, whose exact locations were not available.
SOURCE HRS, 1979.

The Industry Dimension

Establishments engaged in mining and manufacturing have been most affected by personnel shortages.[3] In both of these sectors, 62 per cent of the responding firms reported hiring difficulties in the 1977-79 period (Table 3-6). For the upcoming period, mining companies, in particular, anticipated difficulties in meeting their skill requirements. While the other sectors are less influenced by shortages, there are specific problem areas that can be identified at the regional and sub-industry levels. These will become evident in the ensuing sector-by-sector discussion of the incidence of hiring difficulties.

Table 3-6

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Mining	29	62.1	65.5
Construction	110	44.6	36.4
Manufacturing	442	62.0	55.4
Transportation, communication, and utilities	86	31.4	26.7
Trade	353	43.3	36.3
Finance, insurance, and real estate	51	49.0	35.3
Services	283	43.5	38.5
All industries	1,354	49.4	43.0

SOURCE HRS, 1979.

Mining

The findings of the Human Resources Survey pertaining directly to the mining industry must be considered with caution because of the small sample size. It is confidence-inspiring, though, to note that the results are extremely similar to those produced by a much more inclusive industry-specific survey recently carried out by the Mining Association of Canada.[4]

As mentioned, the HRS found a very high incidence of shortages among the responding mining establishments. Furthermore, this is the only sector in which the reported rate of expected hiring difficulties exceeded that of the past. Mining is a rapidly expanding industry with increasing requirements for skilled personnel. Much of this growth is in Western Canada and, noted in Table 3-7, over three-quarters of the participating establishments in that region are affected by hiring difficulties.

Table 3-7

The Incidence of Hiring Difficulties in Mining, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	3	33.3	33.3
Quebec	5	20.0	40.0
Ontario	4	75.0	75.0
The West	17	76.5	76.5
Canada	29	62.1	65.5

SOURCE HRS, 1979.

Detailed breakdowns of the shortages within mining are problematic, given the small number of firms surveyed in the industry. The results do suggest, though, that the sector's skill-related difficulties are concentrated in those operations extracting metals or

oil and gas rather than in establishments mining nonmetallic minerals (Table 3-8).

Table 3-8

The Incidence of Hiring Difficulties in Mining, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Metal	9	77.8	88.9
Bituminous coal	1	100.0	100.0
Oil and gas	8	87.5	87.5
Nonmetallic minerals	11	27.3	27.3
All mining	29	62.1	65.5

SOURCE HRS, 1979.

Construction

The skill needs of the construction industry are complicated by the volatile demand fluctuations that characterize the sector. The "boom and bust" nature and its attendant employment instability often dictate severe regional variations in the tightness of the industry's labour market.[5] The HRS data provide evidence of this phenomenon, as contractors in Western Canada face major difficulties in meeting skill requirements, while their eastern counterparts do not. As Table 3-9 indicates, 72.1 per cent of the respondents in the West reported shortage-related problems in the 1977-79 period, while in the rest of the country only a small minority were affected.

Table 3-9

The Incidence of Hiring Difficulties in Construction, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	7	–	14.3
Quebec	27	25.9	18.5
Ontario	33	33.3	30.3
The West	43	72.1	55.8
Canada	110	44.6	36.4

SOURCE HRS, 1979.

During 1980-84, western contractors again anticipated the greatest incidence of hiring difficulties. Despite forecasts that the boom will continue, however, Table 3-9 shows that shortages in this region are not expected to be as grave as those reported in the earlier period. Rather than pointing to an adjustment to the imbalances, this decrease may largely reflect the uncertainty that is currently facing the construction industry in the West.

Finally, the Survey findings indicate that the incidence of shortages has been similar for the different types of construction activity (Table 3-10). Anticipations of future hiring difficulties do not vary significantly in this respect either.

Table 3-10

The Incidence of Hiring Difficulties in Construction, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
General building contractors	25	40.0	32.0
Other general contractors	25	44.0	36.0
Special trade contractors	60	46.7	38.3
All construction	110	44.6	36.4

SOURCE HRS, 1979.

Manufacturing

Much of the initial attention paid to the issue of skill shortages focused upon the problems in manufacturing.[6] In light of this, the HRS results indicating a high incidence of hiring difficulties in this sector were not unexpected. Among the establishments surveyed, those in manufacturing have been, and will continue to be, more affected by shortages than the respondents in all other sectors, with the exception of mining.

The regional variations in the incidence of hiring difficulties among manufacturers closely resemble those for the HRS sample as a whole. Table 3-11 shows that the percentage of establishments experiencing and anticipating shortages was considerably greater in the West than elsewhere in the country. In particular, respondents from Alberta reported an extremely high incidence; 83.3 per cent suffered shortages in 1977-79, and 87.5 per cent

expected similar problems in the 1980-84 period. Manufacturers in Quebec and the Atlantic region were the least affected by hiring difficulties, while Ontario fit in between, slightly above the national average.

Table 3-11

The Incidence of Hiring Difficulties in Manufacturing, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	15	46.7	33.3
Quebec	132	51.5	39.4
Ontario	217	64.1	60.8
The West	78	76.9	71.8
Canada	442	62.0	55.4

SOURCE HRS, 1979.

Table 3-12

The Incidence of Hiring Difficulties in Manufacturing, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Durable goods	226	66.8	61.1
Lumber and wood	40	80.0	72.5
Furniture	18	33.3	33.3
Stone, clay, glass, concrete	17	41.2	52.9
Primary metal	21	61.9	47.6
Fabricated metal	44	63.6	56.8
Machinery	42	85.7	78.6
Electrical equipment	28	67.9	60.7
Transportation equipment	16	62.5	56.3
Nondurable goods	216	56.9	49.5
Food and beverages	44	50.0	45.5
Textiles	14	57.1	50.0
Clothing	45	55.6	51.1
Paper	15	46.7	46.7
Printing and publishing	22	59.1	50.0
Chemicals	30	53.3	40.0
Petroleum refining	3	66.7	66.7
Rubber	17	82.4	70.6
Leather	4	100.0	100.0
Miscellaneous	22	54.6	40.9
All manufacturing	442	62.0	55.4

SOURCE HRS, 1979.

The extent of shortages in the various types of manufacturing is shown in Table 3-12. For both time periods, the makers of durable goods reported a higher incidence of problems than the establishments producing nondurable commodities. Within the former group, the HRS findings indicate that shortages affect the largest percentage of firms in the machinery and in the lumber and wood product sectors. Manufacturers of rubber products, among the nondurables, also have a high incidence rate. With only a few exceptions, the other types of manufacturing reported relatively similar levels of hiring difficulties.

Transportation, Communication, and Utilities

On the basis of the survey data, this industry is affected by skill shortages to a lesser extent than any other. Fewer than one-third of the participating establishments experienced difficulties in 1977-79, and only slightly more than one-quarter anticipated problems in the upcoming period. In particular, respondents from Quebec appear to be untouched by shortages (Table 3-13). Ontario establishments also reported very low incidence levels, while Western Canada rates considerably exceeded the national figures for the industry. The levels reported for the Atlantic region were also relatively high; but, obviously, the extremely small sample size should be noted.

Table 3-13

The Incidence of Hiring Difficulties in Transportation, Communication, and Utilities, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	8	62.5	37.5
Quebec	21	9.5	9.5
Ontario	31	25.8	22.5
The West	26	46.2	42.3
Canada	86	31.4	26.7

SOURCE HRS, 1979.

In many ways, this industry group is a mixed bag. Wide variations exist in the kinds of activities carried out; as a result, within the sector, there are great differences in the skills required. The HRS results, however, do not clearly identify major sub-industry

variations in terms of the incidence of shortage-related problems (Table 3-14).

Table 3-14

The Incidence of Hiring Difficulties in Transportation, Communication, and Utilities, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establish-ments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Transportation	67	31.3	28.4
Railroad	1	–	–
Local transit, and intercity highway	13	30.8	38.5
Motor freight, and warehousing	37	27.0	18.9
Water	2	50.0	50.0
Air	5	80.0	80.0
Transportation services	9	22.2	22.2
Communication	10	20.0	10.0
Utilities[1]	9	44.4	33.3
All Transportation, communication, and utilities	86	31.4	26.7

1 Utilities includes electric, gas, and sanitary services.
SOURCE HRS, 1979.

Trade

The incidence of hiring difficulties within the trade sector is slightly below the rate for the entire HRS sample. During the 1977-79 period, 43.3 per cent of the participating establishments experienced shortages, while 36.3 per cent anticipated problems up to 1984. From Table 3-15, it can be seen that in this industry, too, the West reported the highest levels. Alberta sales operations, in particular, appear to be affected by hiring problems, as 78 per cent identified past difficulties and 71 per cent expected future trouble.

Table 3-16 indicates that respondents engaged in retail trade have greater incidences of hiring difficulties than their counterparts in wholesale. Within the former group, shortages affected automotive and gasoline retailers the most, followed by the eating and drinking establishments and food stores. Among the wholesalers, operations that trade in durable goods were the most stricken by hiring problems.

Finance, Insurance, and Real Estate

Finance, insurance, and real estate experienced virtually the same incidence of hiring difficulties during 1977-79 as did the entire HRS sample. For the 1980-84 period, however, the anticipation of skill-related problems was the second lowest among all industries. While a detailed breakdown of the shortages is problematic because of the size of the sample, Table 3-17 indicates that this expected decrease could be largely attributed to the downward trend in the West.

Table 3-15

The Incidence of Hiring Difficulties in Trade, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	31	41.9	38.7
Quebec	93	35.5	25.8
Ontario	133	37.6	30.8
The West	96	59.4	53.1
Canada	353	43.3	36.3

SOURCE HRS, 1979.

Table 3-16

The Incidence of Hiring Difficulties in Trade, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Wholesale trade	154	35.1	30.5
Durable goods	104	39.4	37.5
Nondurable goods	50	26.0	16.0
Retail trade	199	49.7	40.7
Building materials	10	20.0	20.0
General merchandise	20	50.0	40.0
Food	26	46.2	34.6
Automotive, gasoline	59	67.8	57.6
Apparel	8	25.0	25.0
Home furnishings	9	22.2	22.2
Eating, drinking places	44	52.3	43.2
Miscellaneous	23	34.8	21.7
All trade	353	43.3	36.3

SOURCE HRS, 1979.

The incidence of hiring difficulties at the sub-industry level is shown in Table 3-18. During 1977-79, the three components of the sector recorded similar shortage rates. For the upcoming period, though, financial establishments anticipated a much lower incidence of problems. Again, however, this result must be interpreted with caution because of the number of respondents involved.

Table 3-17

The Incidence of Hiring Difficulties in Finance, Insurance, and Real Estate, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	6	50.0	50.0
Quebec	9	55.6	55.6
Ontario	17	41.2	35.3
The West	19	52.6	21.1
Canada	51	49.0	35.3

SOURCE HRS, 1979.

Table 3-18

The Incidence of Hiring Difficulties in Finance, Insurance, and Real Estate, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Finance	15	46.7	26.7
Insurance	19	52.6	42.1
Real Estate	15	53.3	40.0
Miscellaneous	2	-	-
All finance, insurance, and real estate	51	49.0	35.3

SOURCE HRS, 1979.

Services

Among the HRS respondents in the services sector, 43.5 per cent experienced hiring difficulties in 1977-79, and 38.5 per cent anticipated problems in 1980-84. In Table 3-19, the incidence rates for Quebec are much lower than those for the other regions. In this industry, too, the western levels are highest in Alberta, where over 60 per cent of the participating establishments reported as anticipated shortages in the two time periods considered.

The Survey results indicate that, of all the different types of activities within the sector, business services have been the most affected by hiring difficulties (Table 3-20). A further breakdown shows that, in particular, firms providing engineering and financial services to businesses faced the most problems in meeting skill requirements. Education and social services and the health services also experienced relatively high shortage rates. While establishments in the latter sub-industry anticipate the same incidence of problems in the future, those in the former group expected lower levels in the years up to 1984.

Table 3-19

The Incidence of Hiring Difficulties in Services, Experienced and Anticipated, by Region, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Atlantic region	21	47.6	38.1
Quebec	76	29.0	22.4
Ontario	103	48.5	43.7
The West	83	49.4	47.0
Canada	283	43.5	38.5

SOURCE HRS, 1979.

Table 3-20

The Incidence of Hiring Difficulties in Services, Experienced and Anticipated, by Sub-Industry, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Accommodation	46	37.0	34.8
Personal	7	28.6	28.6
Business	104	50.0	46.2
Repair (incl. automotive)	17	23.5	29.4
Amusement, and recreation	18	27.8	22.2
Health	39	46.2	46.2
Education, and social	52	48.1	30.8
All services	283	43.5	38.5

SOURCE HRS, 1979.

The Organizational Dimension

The Human Resources Survey collected information on a number of organizational characteristics. In this section, the relationship of some of these to the incidence of shortages is considered. Included in the discussion are establishment size and age, collective bargaining coverage, and average levels of pay.

Establishment Size

The differential effect of hiring problems, by establishment size, is presented in Table 3-21. The figures indicate that there is a positive link between the number of employees and the incidence of shortages. For example, during 1977-79 period, 35.6 per cent of the establishments with fewer than 20 employees experienced hiring difficulties. This figure increases in each successively larger category and, of the organizations with at least 500 employees, 74 per cent reported problems.

Table 3-21

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Establishment Size, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Establishment size (number of full-time employees):			
Less than 20	208	35.6	30.3
20-49	492	44.5	39.4
50-99	230	50.4	44.4
100-499	234	63.7	55.1
500 or more	73	74.0	60.3
All establishments[1]	1,237	49.5	43.0

1 Except for 117, the size of which could not be ascertained.
SOURCE HRS, 1979.

This strong positive relationship between establishment size and the incidence of hiring difficulties is not surprising, since (if only because of the numbers involved) the personnel needs would tend to be simpler for a small organization than for a large one. Thus it is more likely that the latter would have experienced and/or anticipated problems in finding all the required skills.

As a result, then, the figures presented in Table 3-21 cannot be interpreted to mean that shortages pose a more serious problem for large companies than for small ones. Perhaps a more meaningful test of this would have been to compare establishment vacancy/employment ratios on the basis of size. Unfortunately, however, any such efforts were impeded by problems associated with the data in terms of the *actual number* of vacancies that resulted from a shortage of skilled personnel.[7]

Establishment Age

The basis of a possible link between the age of an organization and hiring difficulties rests upon the notion that the older the firm, the more effective it might be in meeting its personnel requirements.[8] On the basis of the HRS data, however, this hypothesis is not supported. Table 3-22 indicates no clear pattern characterizing the relationship between years in operation and the incidence of shortages.

Table 3-22

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Establishment Age, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Establishment age (years in operation):			
Less than 4	95	45.3	39.0
4-9	232	50.4	48.7
10-24	431	53.4	47.5
25-49	325	45.2	38.5
50 or more	219	52.1	41.6
All establishments[1]	1,292	50.0	43.8

1 Except for 62, the age of which could not be ascertained.
SOURCE HRS, 1979.

Collective Bargaining Coverage

Do unionized establishments have more or fewer problems in meeting their skill requirements than their non-unionized counterparts? It has been suggested that, in some cases, collective agreement clauses on hiring and training may reduce the flexibility of company personnel programs, making it more difficult to fill vacancies. The opposite viewpoint holds that unions carry out an important communication function, providing members with information on employment opportunities and thereby improving the match of people and jobs. The HRS results support neither of these perspectives; rather, they suggest that no significant relationship exists between union presence and the incidence of shortages. Table 3-23 shows that for office and non-office employees, respectively, majority collective bargaining coverage does not have a clear effect on the success of an establishment in meeting its skill requirements.

Table 3-23

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Union Status of Office and Non-Office Employees, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Union status (collective bargaining coverage of full-time personnel):			
Office employees			
50 per cent or more	83	50.6	36.1
Less than 50 per cent	1,094	49.2	43.6
All establishments[1]	1,177	49.3	43.1
Non-office employees			
50 per cent or more	418	51.7	45.0
Less than 50 per cent	775	48.4	42.1
All establishments[2]	1,193	49.5	43.1

1 Except for 177, in which cases the union status of the office employees was unavailable.
2 Except for 161, in which cases the union status of the non-office employees was unavailable.
SOURCE HRS, 1979.

Establishment Pay

The incidence of hiring difficulties, by average pay level of establishments, is presented in Table 3-24.[9] As can be seen, respondents with greater average weekly wages/salaries were more likely to experience and/or anticipate shortages than companies with lower rates of compensation.

Once the interactive effects of establishment size have been taken into account, however, the apparent relationship between average pay and hiring difficulties is not so clear. The results of an analysis-of-variance test indicate that the value for the pay variable is insignificant for 1977-79 but significant for 1980-84 (5 per cent confidence level). Thus, the HRS results must be considered inconclusive with respect to the link between compensation levels and hiring problems.

Table 3-24

The Incidence of Hiring Difficulties, Experienced and Anticipated, by Establishment Pay, 1977-79 and 1980-84

	Number of establishments	Establishments that experienced or expect difficulties	
		1977-79	1980-84
		(Per cent)	
Establishment pay (average gross weekly wage/salary for full-time personnel):			
Less than $200	100	37.0	33.0
$200 - $299	374	42.3	34.2
$300 - $399	279	53.1	46.6
$400 or more	161	60.3	55.9
All establishments[1]	914	48.1	41.7

1 Except for 440, in which cases pay information was unavailable.
SOURCE HRS, 1979.

Summary

This chapter has focused on the incidence of hiring difficulties in this country. Data collected by the Human Resources Survey suggest that shortages do constitute a significant problem. About one-half of the participating establishments experienced some difficulties in meeting their skill requirements during the 1977-79 period, and most of them anticipated similar problems up to 1984.

Not unexpectedly, shortages were found to be most prevalent in Western Canada, particularly in Alberta. While problems are less frequent elsewhere in the country, they are certainly not unknown. On an industry basis, mining and manufacturing have been, and will continue to be the most affected by hiring difficulties. Among the other sectors, there are additional problem areas. Some of these, like construction in the West, can be defined geographically; others are isolated in sub-industries, such as auto retailing. Finally, the relationships between hiring difficulties and certain organizational characteristics were considered. The only discernible pattern to emerge was that large establishments are more likely to face problems in meeting their skill requirements than small ones.

4 Occupational Skills in Demand

Having discussed the differential effect of shortages on Canadian establishments, we now turn to the particular occupations that have been, and are expected to be, in short supply. Before presenting the results, it should be emphasized that the data collected by the Human Resources Survey cannot, of course, be interpreted as a complete national registry of imbalances in the Canadian labour market. In fact, such an information base does not exist. In order to create one, appropriate supply and demand data need to be gathered in a systematic and regular fashion; unfortunately, at the present time, this is not being done in this country.[1]

It is necessary, then, to recognize the limitations of the HRS as a sample survey. On the basis of its coverage and representativeness, however, it does provide some indication of the kinds of skills that are in short supply in Canada. This chapter begins with a general description of the types of occupational shortages cited by the HRS respondents. Following this, a breakdown by region and industry is presented.

Finally, a prefatory note to the ensuing discussion. The occupational data collected by the Survey have been coded on the basis of the 1971 version of the Canadian Classification and Dictionary of Occupations (CCDO).[2] Throughout this and subsequent chapters, reference is made to two levels of this system. The more aggregate of these, the *major* occupation group, corresponds to the 2-digit classification level; the other one, the *unit* occupational group, parallels the 4-digit breakdown.

Occupational Shortages

The distribution of hiring difficulties, by major occupational group, is shown in Table 4-1. It should be pointed out that the data presented in this table do *not* refer to the number of employees required but rather to the frequency with which an occupation has been associated with hiring problems. Perhaps the first thing to notice is that, once again, there is a marked similarity between the shortages reported for 1977-79 and those anticipated for 1980-84.

Table 4-1

Shortage Situations Experienced or Anticipated, by Major Occupational Group, 1977-79 and 1980-84

	Proportion of all situations	
	1977-79	1980-84
	(Per cent)	
Product fabricating and repair	20.4	22.3
Machining	13.2	13.4
Sciences and engineering	12.6	12.2
Clerical	8.5	6.5
Sales	8.1	7.5
Service	6.7	7.0
Managerial	6.0	4.2
Processing	5.7	7.5
Construction trades	5.7	5.2
Other	13.1	14.2
All occupations	100.0	100.0

SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

In both periods, hiring difficulties have been most frequently cited for personnel in the product fabricating and repair group. During the 1977-79 period, 20.4 per cent of all shortage situations involved this category, while the corresponding figure anticipated for 1980-84 was 22.3 per cent. The second most often cited group was in machining, which accounted for slightly more than 13 per cent of the hiring difficulties in each of the periods considered.

Unlike product fabricating and repair or machining each of which is a blue-collar category, the other major shortage area – sciences and engineering – involves white-collar skills. Just over 12 per cent of the hiring problems reported or anticipated fall into this class of occupations. As Table 4-1 indicates, a number of other groups accounted for smaller, yet significant, shares of all the difficulties reported.

The Survey also requested information on the number of employees required in each shortage situation. These responses have been aggregated, by major occupational group, and the results are shown in Table 4-2. While these data provide an additional

Table 4-2

Estimated Vacancies because of Shortage Situations Experienced or Anticipated, by Major Occupational Group, 1977-79 and 1980-84

	Estimated vacancies			
	1977-79		1980-84	
	Number	Proportion of total	Number	Proportion of total
		(Per cent)		(Per cent)
Product fabricating and repair	1,465	21.5	2,505	23.6
Machining	921	13.5	1,191	11.2
Sciences and engineering	600	8.8	1,281	12.1
Construction trades	546	8.0	507	4.8
Service	520	7.6	506	4.8
Processing	487	7.1	604	5.7
Sales	409	6.0	539	5.1
Clerical	367	5.4	696	6.6
Managerial	223	3.3	439	4.1
Other	1,279	18.8	2,329	22.0
All occupations	6,817	100.0	10,597	100.0

SOURCE HRS, 1979.

dimension to the shortage picture, their extremely raw quality must be recognized.[3]

Imperfections notwithstanding, the vacancy statistics estimated from the HRS returns essentially confirm the occupational shortage patterns described above.[4] In terms of the number of employees required in difficult hiring situations, product fabricating and repair has been, and will continue to be, the single most important group. Of the estimated 6,817 vacancies associated with shortages in 1977-79, 21.5 per cent involved jobs falling into that category. Similarly, product fabricating and repair occupations accounted for 23.6 per cent of the estimated employment gap of 10,597 anticipated by the HRS sample for 1980-84.

The number of positions affected by hiring difficulties for machining were also very significant. This group's share of all vacancies was 13.5 per cent in 1977-79 and was expected to be 11.2 per cent in the upcoming period. According to the participating establishments, the relative demand for science and engineering personnel will increase in the 1980-84 period. While this category accounted for 8.8 per cent of the employment gap in 1977-79, the corresponding anticipated figure for the period up to 1984 was is 12.1 per cent.

The following breakdown of hiring difficulties within some of the most important major occupational groups should help to further identify the skills reported to be in short supply. It should be noted that the tables and most of the discussion in this section refer to shortage situations rather than to the estimated numbers of vacancies associated with the hiring problems.

Product Fabricating and Repair

This major group includes occupations that use components and assemblies to produce or repair a wide range of products. As noted, the HRS results indicate that this category accounts for a greater share of hiring difficulties than any other.

Product fabricating and repair consists of blue-collar occupations that encompass a wide range of skills. Not surprisingly, it is, for the most part, the higher-level skills that have been, and will continue to be, in short supply. More specifically, advanced mechanical and repairing positions pose the most serious problems. Actually, one such job type – machinery mechanic – was cited as a shortage area by Survey respondents more often than any other unit occupation in the entire labour market. This group, which includes diesel mechanics, engine mechanics, millwrights, and mine mechanics, among others,[5] accounts for close to one-third of all the hiring problems cited within the product fabricating and repair category (Table 4-3).

Following machinery mechanics, motor vehicle mechanics and equipment electricians are most in demand within the major group. Both of these are also highly skilled, repair-oriented occupations. On the other hand, sewing machine operating is not; yet it, too, is a significant shortage area in product fabricating and repair.

Table 4-3

Shortage Situations Experienced or Anticipated in Product Fabricating and Repair, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Machinery mechanics (8584)[1]	31.8	30.3
Motor vehicle mechanics (8581)	18.1	16.6
Equipment electricians (8533)	10.3	10.0
Sewing machine operators (8563)	9.3	9.3
Other	30.5	33.8
All product fabricating and repair occupations	100.0 (*n*=321)	100.0 (*n*=290)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Machining

The machining group is comprised of occupations that use machines and tools to shape or work materials such as metal, wood, plastic, glass, and stone. For both of the time periods considered by the HRS, slightly more than 13 per cent of all hiring difficulties fell into this group.

The most prevalent specific shortage within the major category is for machinists (Table 4-4). This unit group, which includes tool machinists and tool setters, accounted for 29.5 per cent of all hiring problems in machining in 1977-79 and for 32.8 per cent of those anticipated for 1980-84. Other prominent skill shortages exist in welding and in tool and die making. Less numerous, but significant nonetheless, are the hiring difficulties reported for machine tool operators.

Table 4-4

Shortage Situations Experienced or Anticipated in Machining, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Machinists (8313)[1]	29.5	32.8
Welders (8335)	19.8	21.8
Tool and die makers (8311)	17.4	19.5
Machine tool operators (8315)	8.7	6.3
Other	24.6	19.6
All machining occupations	100.0 (*n*=207)	100.0 (*n*=174)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Sciences and Engineering

The sciences and engineering category was the most frequently mentioned problem area of all the major white-collar groups. In both 1977-79 and 1980-84, the sciences and engineering occupations accounted for more than 12 per cent of all reported or anticipated shortage situations. In terms of the number of employees required, the HRS data suggest that the unmet demand for people in this category is becoming more serious. While the group accounted for 8.8 per cent of all shortage-related vacancies reported for 1977-79, the estimated figure for the 1980-84 period was 12.1 per cent (Table 4-2).

The breakdown of hiring difficulties within the sciences and engineering group is shown in Table 4-5. During both time periods, close to one-half of the shortage situations involved engineers. In the earlier period, difficulties in finding industrial engineers were the most prevalent; for the upcoming period, troubles were anticipated most often for those with mechanical backgrounds. It should be emphasized, however, that meeting the need for virtually all types of engineers was consistently reported to be a problem for the Survey respondents.

Table 4-5

Shortage Situations Experienced or Anticipated in Sciences and Engineering, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Engineers	42.9	47.2
Industrial (2145)[1]	10.1	7.5
Mechanical (2147)	9.1	12.6
Electrical (2144)	7.1	8.2
Civil (2143)	5.1	6.3
Other	11.5	12.6
Systems analysts/programmers (2183)	14.6	15.7
Engineering technologists (2165)	14.6	12.0
Draughters (2163)	11.1	10.7
Other	16.8	14.4
All science and engineering occupations	100.0 (*n*=198)	100.0 (*n*=159)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Not unexpectedly, the HRS findings indicate significant shortages for personnel skilled in systems analysis and programming. This occupation accounted for 14.6 per cent and 15.7 per cent of the hiring difficulties reported or anticipated within the major group for the 1977-79 and 1980-84 periods, respectively. Moreover, the Survey results suggest that, in terms of the numbers associated with these shortages, the employment gap for systems people will be much larger in future years than in the past. Other skills reported to be in excess demand include engineering technology and draughting.

Clerical

The remaining major groups to be considered are not as strongly associated with shortages as product fabricating and repair, machining, or sciences and engineering. Nevertheless, the HRS data indicate that there are some problems with imbalances in these other categories. For example, 8.5 per cent and 6.5 per cent of all hiring difficulties reported in 1977-79 and expected in 1980-84, respectively, involved clerical jobs.

The distribution of shortages among different clerical skills is shown in Table 4-6. During the earlier period, the secretarial group had the greatest frequency of hiring difficulties, while more problems were anticipated for clerk-typists in the future than for any other clerical position.

Table 4-6

Shortage Situations Experienced or Anticipated in the Clerical Category, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Secretaries (4111)[1]	20.1	19.0
Accounting clerks (4131)	17.9	13.1
Clerk-typists (4113)	16.4	21.4
EDP equipment operators (4143)	10.4	10.7
Other	35.2	35.8
All clerical occupations	100.0 (*n*=134)	100.0 (*n*=84)

n – number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Sales

The sales category is another in which there appear to be minor, yet visible, difficulties. Among the establishments surveyed, it accounted for 8.1 per cent of all shortage situations in 1977-79, and its share of the problems anticipated for 1980-84 was expected to be 7.5 per cent. The group includes occupations that sell both commodities and services; yet, as Table 4-7 indicates, all of the most prominent shortages involved commodity sales. In particular, supervisors of this activity appear to be in short supply. Some problems were also cited for virtually all other personnel involved with selling goods, from highly skilled technical salespersons to relatively unskilled clerks.

Table 4-7

Shortage Situations Experienced or Anticipated in Sales, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Commodity sales supervisors (5130)[1]	26.0	26.8
Commodity salespersons (5135)	17.3	17.5
Sales clerks (5137)	11.8	8.2
Technical salespersons (5131)	11.0	12.4
Commercial travellers (5133)	10.2	10.3
Other	23.7	24.8
All sales occupations	100.0 (*n*=127)	100.0 (*n*=97)

n – number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Service

Occupations concerned with providing protective, catering, and accommodation services, and other personal and business services, fall into this major group. In the two time periods considered by the Survey, approximately 7 per cent of all hiring difficulties involved this category. From Table 4-8, it is evident that most of the problems have been, and will continue to be, with the catering service skills in particular. Most notable were the difficulties reported by establishments searching for chefs and cooks. In fact, this specific occupation accounts for one-third of all shortage situations within the service group. Food servers and supervisors are other catering positions frequently cited as difficult to fill.

Managerial

Shortage situations involving managerial jobs comprised 6 per cent of all hiring difficulties reported for 1977-79 and 4.2 per cent of those anticipated

Table 4-8

Shortage Situations Experienced or Anticipated in the Service Category, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Chefs (6121)[1]	33.3	33.0
Food servers (6125)	18.1	16.5
Janitors (6191)	16.2	12.1
Food service supervisors (6120)	8.6	7.7
Other	23.8	30.7
All service occupations	100.0 (*n*=105)	100.0 (*n*=91)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

during 1980-84. As can be seen from Table 4-9, accounting is clearly the managerial skill most in demand. Moreover, the severity of the imbalance in this specific occupation is even greater when the estimated vacancy statistics are considered. Nearly 75 per cent of the openings resulting from managerial shortage situations expected in the 1980-84 period are for personnel with accounting skills. Of course, this specific figure must be viewed with caution. As mentioned before, this aspect of the HRS data is relatively crude, particularly at the unit group level, where the number of observations is often rather limited.

Table 4-9

Shortage Situations Experienced or Anticipated in the Managerial Category, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Accountants (1171)[1]	33.0	35.2
Production managers (1143)	9.6	11.1
Financial managers (1135)	8.5	9.3
Sales managers (1137)	7.4	13.0
Other	41.5	31.4
All managerial occupations	100.0 (*n*=94)	100.0 (*n*=54)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

With the exception of accounting, there are no specific occupations within the managerial category that appear to be in significant excess demand. As Table 4-9 indicates, other hiring difficulties within the major group are quite dispersed.

Processing

This is a "grab bag" of jobs concerned with transforming essentially raw materials into semi-finished and finished goods. During the 1977-79 period, 5.7 per cent of all hiring difficulties fell into this category, while the share anticipated for 1980-84 was 7.5 per cent. Although the Survey results do not identify any glaring shortages in this major group, close to one-half of the hiring difficulties involve various food and beverage processing skills. The unit group breakdown of occupations indicates the frequency of problems associated with meat cutters and, to a lesser degree, bakers (Table 4-10).

Table 4-10

Shortage Situations Experienced or Anticipated in Processing, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Meat cutters (8215)[1]	18.0	17.5
Bakers (8213)	9.0	8.2
Sawyers (8231)	7.9	9.3
Moulders (8137)	5.6	8.2
Other	59.5	56.8
All processing occupations	100.0 (*n*=89)	100.0 (*n*=97)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Construction Trades

The construction trades group accounted for slightly more than 5 per cent of the shortage situations reported in each of the time periods covered by the Survey. As noted in Chapter 3, hiring difficulties in the construction sector are heavily concentrated in the West; thus the skills in this occupational category are in greatest demand in that region of the country.

On a national scale, shortages of personnel skilled in excavating and grading were the most prevalent within the group during 1977-79 (Table 4-11). For the upcoming years, pipefitters and plumbers were expected to pose the greatest problems.

Table 4-11

Shortage Situations Experienced or Anticipated in the Construction Trades, by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Excavators and graders (8711)[1]	20.2	16.4
Pipefitters and plumbers (8791)	16.9	20.9
Carpenters (8781)	14.6	13.4
Other occupations	48.3	49.3
All construction trades	100.0 (n=89)	100.0 (n=67)

n – number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Regional Skill Shortages

Generally, the occupational breakdown of shortages is quite similar in all regions of Canada (Table 4-12). For example, the product fabricating and repair and the sciences and engineering categories pose major hiring difficulties for employers across the country. These overall similarities notwithstanding, there are some regional distinctions that tend to stem from variations in the kinds of industrial activities carried out.

Atlantic Region

According to Table 4-12, hiring difficulties in the Atlantic region, are most prominent in the service occupational group. This category accounted for 19.2 per cent (1977-79) and 20.3 per cent (1980-84) of all of the region's reported and anticipated shortages – shares that are much higher than those for the country as a whole. Approximately one-half of the service difficulties involve chefs and cooks. While shortages of product fabricating and repair personnel appear less serious in Atlantic Canada than elsewhere, they still account for a significant portion of the region's problems. Finally, the extremely low level of difficulties involving the machining, managerial, and construction trades groups should be noted.

Quebec

In this region, shortages in product fabricating and repair are more frequent than those in any other group. Shortages of sciences and engineering personnel are also prominent; in particular, difficulty in finding engineers is expected to increase in the upcoming years. Other groups accounting for significant shares of the region's imbalances are machining, processing, clerical, and sales. On the other hand, service and construction trades shortages are extremely minor.

Table 4-12

Shortage Situations Experienced or Anticipated in All Occupations, by Major Occupational Group and by Region, 1977-79 and 1980-84

	Proportion of regional total							
	Atlantic region		Quebec		Ontario		The West	
	1977-79	1980-84	1977-79	1980-84	1977-79	1980-84	1977-79	1980-84
	(Per cent)							
Product fabricating, repair	15.4	14.9	21.1	24.7	23.4	23.8	7.8	20.7
Machining	2.9	1.4	10.4	10.6	22.7	23.3	6.7	5.9
Sciences and engineering	10.6	8.1	17.6	14.9	11.8	10.5	11.0	13.5
Clerical	12.5	8.1	11.0	8.1	7.4	6.0	7.6	5.9
Sales	6.7	8.1	10.1	8.5	4.8	4.5	10.6	10.1
Service	19.2	20.3	3.8	3.0	5.8	7.4	6.9	6.5
Managerial	3.9	1.4	9.1	6.4	3.1	2.1	7.6	5.7
Processing	5.8	12.2	7.9	12.3	4.1	4.7	6.0	7.4
Construction trades	2.9	1.4	1.3	2.1	3.6	4.1	10.8	8.4
Other	20.1	24.1	7.7	9.4	13.3	13.6	15.0	15.9
All occupations	100.0 (n=104)	100.0 (n=74)	100.0 (n=318)	100.0 (n=235)	100.0 (n=585)	100.0 (n=516)	100.0 (n=566)	100.0 (n=474)

n – number of shortage situations.
SOURCE HRS, 1979.

Ontario

The high incidence of hiring difficulties in the product fabricating and repair and the machining categories reflects the concentration of manufacturing activity in Ontario. In both periods, these two groups, together, accounted for over 45 per cent of the region's reported and anticipated shortages. More specifically, the greatest excess demand exists for machinists, machinery mechanics, tool and die makers, welders, motor vehicle mechanics, equipment electricians, and sewing machine operators.

The need for sciences and engineering personnel is also prominent in Ontario. Within this category, over 80 per cent of the hiring difficulties involved positions for engineers, systems analysts/programmers, and engineering technologists.

The West

In this region, too, the most problematic major group is product fabricating and repair. In particular, difficulties meeting requirements for machinery mechanics and, to a lesser degree, motor vehicle mechanics and equipment electricians were reported by western respondents. The second most often cited problem area is the sciences and engineering category; moreover, as Table 4-12 indicates, the demand for this package of skills is expected to increase in the 1980-84 period. The majority of sciences and engineering difficulties are in Alberta where engineering shortages, in particular, were widely reported. In comparison to the other regions, the construction trades pose a major problem in the West. Within this group, excavators and graders, pipefitters and plumbers, and carpenters are most in demand. And, while machining constitutes the second most important shortage occupation nationally, it appears to be only a minor problem area in the West. This would seem to reflect the relatively low profile of manufacturing in this region.

Sectoral Skill Shortages

In this section, the occupational imbalances reported by the HRS respondents are presented on a sector-by-sector basis. In some industries such as manufacturing and, to a lesser degree, services and trade, the relatively large number of shortage situations cited has facilitated identification of the specific skills in demand. On the other hand, this task has been made more problematic in mining, in transportation, communication, and utilities, and in finance, insurance, and real estate because of the small number of shortage situations reported. As a consequence, appropriate caution must be taken in interpreting the results for these three sectors.

Mining

From Table 4-13, we can see the major occupational groups that account for significant portions of the shortage situations cited by mining respondents. As with all of the tables in this section, the shares of particularly prominent unit groups are also presented. Among the participating mining establishments, over one-third of all hiring difficulties reported for 1977-79 and anticipated for 1980-84 involved sciences and engineering personnel. Table 4-13 shows that the single most often cited unit occupation within this category is geologists. While no specific type of engineer matched this occupation, the Survey results clearly show past and future undersupplies of virtually all types of engineers in the mining sector.

Table 4-13

Shortage Situations Experienced or Anticipated in Mining, by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Sciences and engineering	35.9	36.8
Geologists (2112)[1]	7.8	7.0
Product fabricating and repair	21.9	19.3
Machinery mechanics (8584)	14.1	14.0
Mining	15.6	19.3
Cutters and loaders (7717)	6.3	8.8
Other major groups	26.6	24.6
All occupations	100.0 (*n*=64)	100.0 (*n*=57)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Shortages of workers in the product fabricating and repair group were also reported in this industry. In particular, problems exist in meeting requirements for skilled tradespeople such as machinery mechanics. The other major group often cited was mining. This package of occupations accounts for slightly less than one-fifth of all hiring difficulties anticipated in the sector during 1980-84.

Construction

Not unexpectedly, more than half of the shortage situations cited by the Survey respondents in this sector involved construction trades positions (Table 4-14). Within this major group, hiring difficulties with respect to excavators and graders, carpenters, pipefitters and plumbers, and trades foremen are the

most prominent. As already pointed out, these imbalances are, for the most part, heavily concentrated in Western Canada.

The remainder of the shortages experienced and/or anticipated by the contractors surveyed are scattered among a wide range of major groups. As Table 4-14 indicates, the most important of these are the managerial and the machining categories. Virtually all of the difficulties in the former group pertain to operations managers and accountants, while the need for welders is the most prominent within the latter.

Table 4-14

Shortage Situations Experienced or Anticipated in Construction by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Construction trades	58.1	58.9
Excavators and graders (8711)[1]	14.3	11.1
Carpenters (8781)	7.6	6.7
Pipefitters and plumbers (8791)	6.7	11.1
Foremen-trades (8780)	5.7	6.7
Managerial	9.5	7.8
Machining	7.6	10.0
Other major groups	24.8	23.3
All occupations	100.0 (*n*=105)	100.0 (*n*=90)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Manufacturing

For both periods considered by the HRS, over one-half of the hiring difficulties reported or anticipated in manufacturing involved product fabricating and repair or machining. As Table 4-15 indicates, the critical shortages within these two major groups are, for the most part, of a highly skilled nature. According to the manufacturers surveyed, the most frequent problems have been, and will continue to be, in meeting the need for machinery mechanics and machinists. While shortages of the former skill were cited throughout the sector, reports of difficulties involving machinists were heavily concentrated in the fabricated metal and machinery establishments.

After the product fabricating and repair and the machining groups, the next most prominent problem area covered occupations in sciences and engineering. The unit groups most often cited were industrial engineers, engineering technologists, and systems analysts/programmers.

Table 4-15

Shortage Situations Experienced or Anticipated in Manufacturing by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Product fabricating and repair	27.2	29.8
Machinery mechanics (8584)[1]	9.4	9.9
Sewing machine operators (8563)	3.9	4.1
Equipment electricians (8533)	3.1	3.7
Machining	26.3	26.3
Machinists (8313)	7.9	9.1
Tool and die makers (8311)	4.9	5.3
Welders (8335)	4.2	4.6
Machine tool operators (8315)	2.7	2.0
Sciences and engineering	15.4	13.1
Industrial engineers (2145)	2.8	1.8
Engineering technologists (2165)	2.5	2.1
Systems analysts/programmers (2183)	2.1	2.0
Processing	10.0	12.6
Other major groups	21.1	18.2
All occupations	100.0 (*n*=670)	100.0 (*n*=563)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational groups.
SOURCE HRS, 1979.

Transportation, Communication, and Utilities

The occupational breakdown of the hiring difficulties in transportation, communication, and utilities is presented in Table 4-16. The transport equipment

Table 4-16

Shortage Situations Experienced or Anticipated in Transportation, Communication, and Utilities, by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Transport equipment operating	26.2	30.8
Truck drivers (9175)[1]	13.1	13.5
Product fabricating and repair	19.7	21.2
Clerical	11.5	11.5
Other major groups	42.6	36.5
All occupations	100.0 (*n*=61)	100.0 (*n*=52)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

operating category constituted the major problem area, as it accounted for 26.2 per cent of the shortage situations experienced in 1977-79 and for 30.8 per cent of those anticipated for 1980-84. About one-half of the problems involved truck drivers. Some undersupply of personnel in product fabricating and repair was also reported; in particular, the skills required to repair motor vehicles, aircraft, and machinery have been, and will continue to be, in excess demand.

Trade

The majority of shortage situations in the trade sector fall into the product fabricating and repair and the sales categories (Table 4-17). With regard to the product fabricating and repair imbalances, the single occupational group most often cited was that of motor vehicle mechanics. The excess demand for this skill is almost exclusively concentrated in auto retailing. Finding machinery mechanics has also been a problem, particularly for establishments engaged in wholesale trade.

Table 4-17

Shortage Situations Experienced or Anticipated in Trade, by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Product fabricating and repair	27.7	29.7
Motor vehicle mechanics (8581)[1]	14.3	14.5
Machinery mechanics (8584)	6.4	6.3
Sales	27.4	26.0
Commodity sales supervisors (5130)	10.1	9.7
Commodity salespersons (5135)	6.4	6.3
Services	12.5	13.8
Chefs (6121)	6.1	6.7
Clerical	11.0	7.1
Other major groups	21.4	23.4
All occupations	100.0 (*n*=328)	100.0 (*n*=269)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

With respect to sales occupations, the Survey results suggest that supervisory talents are in greatest demand, specifically among retailers. Most other hiring difficulties in this major retailing group involve commodity salespersons and sales clerks. On the other hand, the sales shortages reported by wholesale operations tend to be for higher-skilled personnel, with technical and commodity specializations.

The other two occupational categories included in Table 4-17 are the service and clerical groups. With respect to the former, the excess demand reported by eating and drinking establishments was mostly for chefs, cooks, and food servers.

Finance, Insurance, and Real Estate

The location of specific imbalances within this industry is constrained by the small number of observations. According to Table 4-18, there were 48 shortage situations cited for 1977-79, and only 29 anticipated for 1980-84. Accordingly, the occupational breakdown is presented warily. From these limited results, we can see that, for the Survey establishments in this sector, meeting the skill requirements for sales, clerical, and, to a lesser extent, managerial personnel has been the most difficult.

Table 4-18

Shortage Situations Experienced or Anticipated in Finance, Insurance, and Real Estate, by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Sales	33.3	37.9
Insurance agents (5171)[1]	20.8	17.2
Clerical	27.1	27.6
Managerial	20.8	13.8
Other major groups	18.8	20.7
All occupations	100.0 (*n*=48)	100.0 (*n*=29)

n - number of shortage situations.
1 The 4-digit CCDO classification appears in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Services

This sector includes a wide range of activities involving the provision of personal, business, community, social services, and reparations. Not surprisingly, then, its shortages are distributed among a number of disparate occupational groups, the most prominent of which is in the service category (Table 4-19). Within this major group, janitors and chefs were cited more often than any other specific position.

Table 4-19

Shortage Situations Experienced or Anticipated in Services, by Major and by Unit Occupational Group, 1977-79 and 1980-84

	Proportion of total	
	1977-79	1980-84
	(Per cent)	
Service	20.5	22.2
Janitors (6191)[1]	5.1	4.2
Chefs (6121)	4.7	5.0
Sciences and engineering	15.2	17.6
Medicine and health	13.8	15.9
Nurses (3131)	3.7	5.4
Clerical	13.1	11.3
Secretaries (4111)	5.1	2.9
Managerial	10.1	5.9
Accountants (1171)	4.4	2.9
Other major groups	27.3	27.1
All occupations	100.0 (*n*=297)	100.0 (*n*=239)

n - number of shortage situations.
1 The 4-digit CCDO classification in parentheses for each unit occupational group.
SOURCE HRS, 1979.

Finding sciences and engineering personnel is also a problem for establishments in this sector, specifically those providing business services. Shortages also exist for some occupations within the medicine and health, clerical, and managerial categories. The primary problem areas within each of the groups involve nurses, secretaries, and accountants, respectively.

Summary

On the basis of the data collected by the Human Resources Survey, the occupational shortages anticipated for 1980-84 are essentially those which posed the greatest problems in 1977-79. For both periods, the most critical shortages involve certain high-level, blue-collar skills. In particular, two such occupational groups – product fabricating and repair, and machining – account for over one-third of all hiring difficulties cited by the Survey respondents. Within the product fabricating and repair category, it is the repairing personnel, such as machinery mechanics, motor vehicle mechanics, and equipment electricians, that are in greatest demand. Specific problem areas in the machining group cover machinists, welders, and tool and die makers. Most of the remaining blue-collar skills that are in short supply fall into the processing and construction trades categories.

The Survey results also indicate hiring difficulties associated with professional and technical jobs. The most serious involve the sciences and engineering group, where particular problem skills include systems analysis/programming, engineering technology, draughting, and most types of engineering. Some difficulties were also cited for other high-level, white-collar positions such as technical and supervisory sales and accounting.

Not all of the shortages reported can be accurately labelled "skill" shortages. In those cases involving relatively lower-skilled positions, the problem lies in the failure to attract or retain workers. There are examples of this phenomenon in the clerical, sales, and service categories, where some of the hiring difficulties are clearly not the result of inadequate supplies of the required skills.

Finally, the geographical and sectoral dimensions of skill shortages must be recognized. In terms of the former, there are strong similarities in all regions of Canada. For example, the product fabricating and repair and the sciences and engineering categories pose major hiring difficulties for employers across the country. The regional distinctions that do exist tend to stem from variations in industrial activity, since, as one might expect, there are significant sectoral differences in terms of the particular skills that are in greatest demand.

5 Adjusting to Shortages

In the two preceding chapters, the dimensions of the shortages faced by the HRS sample were described. Indeed, we have seen that hiring difficulties were reported by a significant portion of the Survey respondents. About half of all the participating firms said they experienced shortages during the 1977-79 period; in fact, in some regions and sectors, the incidence was considerably higher.

Having presented these results, in this chapter we shall deal with the mechanisms employed in response to hiring difficulties. While the adjustment process is central to the allocation of labour resources, our understanding of it is nonetheless inadequate.[1] Certainly, an important reason for this lack of awareness has been the historical acceptance of the classical assumption of economic theory that the allocation function generally takes place through the price (wage) mechanism.

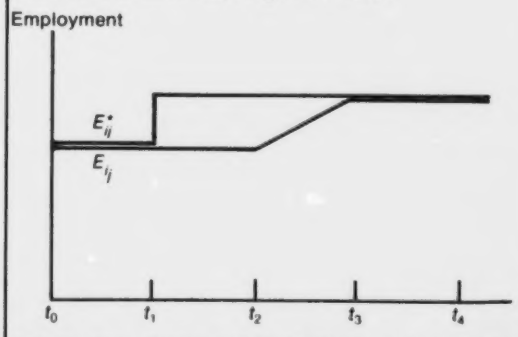
This traditional perspective, however, does not appear to tell the entire story. As we shall see in this chapter, adjusting to imbalances is a complex process in which nonwage mechanisms also play a critical role. In addition to acknowledging the variety of potential responses, one must also recognize the central role of the establishment in this process.[2] Granted, the behaviour of other actors such as governments, unions, and workers, themselves, cannot be discounted; it is, however, the employer who must take the initiative in reacting to a shortage situation.

Since the HRS data were collected on an establishment basis, they are, in many ways, suited to an analysis of the adjustment process.[3] Moreover, for each shortage situation experienced, the respondent was asked to identify the actions taken to solve the problem. In this chapter, we shall take a detailed look at these responses. The types of adjustment mechanisms and their overall importance will be described in the next section. Then, in the remainder of the chapter, variations in the types of responses employed will be addressed.

Responding to Hiring Difficulties

Before commencing this discussion on responses to hiring difficulties, it perhaps would be worthwhile to very briefly consider imbalances, and adjustments, and the link between them. A simple yet helpful framework for looking at these concepts has been developed by Thomas and Denton [1977].[4] This approach is illustrated in Figure 5-1. During the initial period (t_0t_1), the actual level of employment in occupation i at establishment j (E_{ij}) is equal to the desired level of employment (E^*_{ij}). An imbalance is created, however, at time t_1 because of an increase in the demand for employees, with no corresponding rise in the supply. As can be seen, the shortage persists during period t_1t_2. At point t_2, though, the firm begins to make adjustments by somehow increasing the supply of workers and, since the demand has remained constant, the shortage diminishes during t_2t_3 and is eliminated by the end of that period. From this point on, the actual level of employment once again equals the desired level. While Figure 5-1 illustrates a supply-side response, the adjustment to an imbalance can also take the form of a reduction in demand. In this case, then, E^*_{ij} would have fallen. Or

Figure 5-1
Adjustment to Shortage Situations



SOURCE Barry Thomas and David Denton, *Labour Shortage and Economic Analysis: A Study of Occupational Labour Markets* (Oxford: Blackwell, 1977). p. 17.

both supply and demand measures could be used, thus achieving a balance through some upward movement of E_{ij} and some downward movement of E_{ij}^{*}. Theoretically, at any rate, the actual choice of response will be made on the basis of cost minimization, subject to any environmental constraints.[5]

Imbalances, then, can be met by two types of reactions. First, through adjustments by the firm that are designed to increase potential supply and, second, through adjustments by the firm that are designed to decrease potential demand. Theoretically, both of these are "demand-side" responses (in the sense of being employer reactions) for clarity and simplicity, however, we shall label the former "supply adjustments" and the latter "demand adjustments." While there is a wide variety of potential responses available,[6] those considered by the HRS sample include the following:[7]

1 Supply adjustments

- personnel training
- improving wages, benefits
- searching outside the region
- searching outside the country
- lowering qualifications required
- overtime

2 Demand adjustments

- curtailing production
- subcontracting
- capital substitution

Undoubtedly, this list does not exhaust all of the possible adjustment instruments; thus a residual category was included to catch any other types of strategies employed. Since this category, however, was marked in only 4.3 per cent of all shortage situations reported, it can be assumed that the list above incorporates the major adjustment mechanisms.

The modes of response taken by the HRS firms to hiring difficulties are shown in Table 5-1. It is evident that supply strategies predominate. In fact, in 90.9 per cent of the shortage situations cited, the adjustment process involved at least some supply-side measures: in 66.4 per cent of the cases, these were employed by themselves; in the other 24.5 per cent, they were accompanied by demand responses. On the other hand, imbalances were rarely addressed solely by demand-oriented instruments, as this mode accounted for only 5.2 per cent of all adjustment efforts.

Table 5-1

Mode of Response to Shortage Situations, 1977-79

	Proportion of all situations
	(Per cent)
No response reported	3.9
Supply response only	66.4
Demand response only	5.2
Both supply and demand response	24.5
All response modes	100.0 (n=1,573)

n - number of shortage situations.
SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

This lack of reliance on demand-side measures alone is evident once again in Table 5-2, which offers another breakdown of the modes of response to shortage situations. Of cases where some supply adjustment was employed 73 per cent involved supply instruments only; demand mechanisms, however, were more often used *along with* supply strategies.

Table 5-2

Supply and Demand Responses to Shortage Situations, 1977-79

	Proportion of all situations
	(Per cent)
Mode of response (supply):	
Supply adjustment only	73.0
Supply and demand adjustments	27.0
All supply-adjustment situations	100.0 (n=1,430)
Mode of response (demand):	
Demand adjustment only	17.5
Demand and supply adjustments	82.5
All demand-adjustment situations	100.0 (n=468)

n - number of shortage situations.
SOURCE HRS, 1979.

Before looking at the specific measures taken by the HRS establishments when faced with hiring difficulties, it should be kept in mind that multiple adjustments can be made to a single shortage situation. This can take the form of joint utilization of supply and demand mechanisms, as noted above, or the employment of two or more supply strategies or demand strategies at one time. In fact, Table 5-3 shows that fewer than one-third of all adjustment efforts involved the use of only one mechanism. A

significant number of shortage incidents were addressed by two, three, and even more, specific measures. This finding points to the complex nature of adjusting to imbalances. In most cases, a hiring difficulty cannot be solved by one adjustment instrument; more often than not, a number of responses are necessary, at least in the short-run.[8]

Table 5-3

Number of Measures Used in Response to Shortage Situations, 1977-79

	Proportion of all situations
	(Per cent)
Number of measures:	
One	32.5
Two	29.1
Three	20.0
Four or more	18.4
All situations	100.0
	(*n*=1,525)

n – number of shortage situations.
SOURCE HRS, 1979.

The specific responses to hiring difficulties are shown in Table 5-4. The most often used strategy was vocational training, which was employed in 58.1 per cent of all shortage situations. Overtime and search outside the region also appear to be important adjustment strategies, as each was used in over one-third of the hiring difficulties reported by the HRS sample. Less frequently utilized, but significant nonetheless, were the strategies of lowering qualifications and improving wages and benefits. It is interesting to note that the other supply measure – searching abroad – was used in only about one out of every ten shortage situations. Finally, none of the three demand mechanisms were cited as major adjustment instruments. Curtailment of production occurred in 17.2 per cent of hiring difficulties, while the corresponding figures for subcontracting and capital substitution were only 15.7 per cent and 2.5 per cent, respectively.

Table 5-4

Specific Responses to Shortage Situations, 1977-79

	Proportion of all situations[1]
	(Per cent)
Responded to shortages by:	
Training personnel	58.1
Overtime	37.1
Searching outside region	35.2
Lowering qualifications	26.9
Improving wages and benefits	23.4
Curtailing production	17.2
Subcontracting	15.7
Searching outside Canada	10.6
Capital substitution	2.5
	(*n*=1,573)

n – number of shortage situations.
1 Multiple responses to shortage situations account for the fact that the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

The figures shown in Table 5-4 refer, simply, to the frequency with which the specific measures were employed in imbalance situations. They do not consider the extent to which each of these mechanisms was used as a sole or as a partial solution. This information is presented in Table 5-5, which indicates that every instrument was utilized, in most cases, as part of a multiple response effort. Most often used by itself was personnel training; still, in 79.7 per cent of the situations where this measure was employed, it was accompanied by at least one other instrument. The table also indicates that the

Table 5-5

Single and Multiple Adjustments to Shortage Situations, by Specific Response, 1977-79

	Number of shortage situations	Proportion of situations adjusted by:		
		Specific response	Additional response(s)	Total
		(Per cent)		
Responded to shortages by:				
Training personnel	914	20.7	79.3	100.0
Overtime	584	9.6	90.4	100.0
Searching outside region	554	13.7	86.3	100.0
Lowering qualifications	423	12.8	87.2	100.0
Improving wages and benefits	368	6.3	93.7	100.0
Curtailing production	271	14.4	85.6	100.0
Subcontracting	247	10.9	89.1	100.0
Searching outside Canada	166	10.8	89.2	100.0
Capital substitution	40	2.5	97.5	100.0

SOURCE HRS, 1979.

patterns of multiple use were particularly strong when improving wages and benefits and capital substitution were utilized.

Variations in Adjustment Strategies

In this section, we turn to variations in the adjustment strategies taken in response to shortage situations. In looking at this issue, two essential dimensions must be considered. The first of these is the nature of the hiring difficulty; the second is the type of establishment facing the problem.

The Nature of the Shortage

As one might expect, the particular kind of hiring difficulty has some bearing on the adjustment strategy selected. More specifically, we are concerned with the relationship between the response adopted and the occupational skill needed, the duration of the shortage, and the number of vacancies associated with the problem.

Occupational skill required – Certainly, the HRS results suggest that the company solution to an imbalance depends, at least in part, on the type of skill required. In the first place, single-measure adjustments were more common for vacancies in some occupations than for those in others (Table 5-6). This was particularly true where clerical, sales, managerial, and construction trades skills were in demand. For each of these groups, the imbalance

Table 5-6

Single and Multiple Adjustments to Shortage Situations, by Major Occupational Group, 1977-79

	Proportion of situations adjusted by:		
	A single measure	More than one measure	Total
	(Per cent)		
Product fabricating and repair	27.6	72.4	100.0
Machining	23.0	77.0	100.0
Sciences and engineering	28.6	71.4	100.0
Clerical	43.4	56.6	100.0
Sales	45.5	54.5	100.0
Service	26.5	73.5	100.0
Managerial	44.1	55.9	100.0
Processing	23.8	76.2	100.0
Construction trades	45.9	54.1	100.0
All occupations	32.5	67.5	100.0 (*n*=1,525)

n – number of shortage situations.
SOURCE HRS, 1979.

Table 5-7

Specific Responses to Shortage Situations, by Major Occupational Groups, 1977-79

	Proportion of situations adjusted, by occupational group[1]								
	Product fabricating and repair	Machining	Sciences and engineering	Clerical	Sales	Service	Managerial	Processing	Construction trades	All occupations
	(Per cent)									
Responded to shortages by:										
Training personnel	62.9	68.6	40.4	61.2	61.4	68.6	45.7	74.2	43.8	58.1
Overtime	42.7	57.5	35.4	31.3	19.7	38.1	19.1	36.0	31.5	37.1
Searching outside region	32.7	34.8	52.0	12.7	30.7	26.7	52.1	34.8	28.1	35.2
Lowering qualifications	28.0	18.4	23.2	35.1	24.4	40.0	27.7	29.2	27.0	26.9
Improving wages and benefits	22.1	32.9	31.3	24.6	18.9	28.6	18.1	19.1	15.7	23.4
Curtailing production	21.2	28.0	18.2	5.2	17.3	7.6	19.1	10.1	16.9	17.2
Subcontracting	28.3	28.0	20.2	3.0	2.4	4.8	7.4	3.4	20.2	15.7
Searching outside Canada	11.2	14.0	13.1	1.5	4.7	8.6	16.0	10.1	6.7	10.6
Capital substitution	1.2	7.7	2.0	1.5	1.6	–	–	5.6	1.1	2.5
	(*n*=321)	(*n*=207)	(*n*=198)	(*n*=134)	(*n*=127)	(*n*=105)	(*n*=94)	(*n*=89)	(*n*=89)	(*n*=1,573)

n – number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, for each occupational group, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

was addressed by only one mechanism in nearly half of the cases reported. On the other hand, about three-quarters of the hiring difficulties involving product fabricating and repair, machining, sciences and engineering, service, and processing positions were met with multiple response strategies.

Moreover, there were significant differences in the actual adjustment instruments used depending on the type of skill associated with the hiring difficulty (Table 5-7). For example, in cases involving product fabricating and repair personnel, training was the dominant mechanism employed. Overtime and search outside the region were also relied upon to some extent. While fairly similar adjustment patterns characterize the machining category, there was a much greater use of overtime. For both of these skill groups, the frequency of production cuts as an outcome should be noted. According to the HRS data, shortages of machining and product fabricating and repair workers are more likely to curtail output than are imbalances involving any other occupation.

According to Table 5-7, the adjustment processes for sciences and engineering personnel tend to be quite different from those used for the two high-shortage blue-collar groups. More specifically, search outside the region was the most common method used to overcome difficulties, while training and overtime were less important.

Shortages of clerical workers were most often met by training personnel. In addition, lowering the qualifications required was another significant mechanism used to respond to vacancies in this occupation. Similarly, adjustments for both sales and service imbalances emphasized training, while the latter was also characterized by a major reliance on lowering qualifications.

In some ways, the mechanisms employed to solve difficulties involving managers resemble those used for sciences and engineering shortages. For both, there was a relatively low utilization of training, with more emphasis having been placed on finding already skilled people. In fact, searching outside the region and outside the country was more often used for managerial vacancies than for any other type.

Close to three-quarters of the problems associated with processing positions were addressed, at least in part, by training. On the other hand, this strategy was not nearly as important in cases involving the construction trades, where a relatively diverse set of mechanisms contributed to the adjustment effort.

Duration of the shortage – The relationships between the duration of the imbalance situation and the adjustment strategies taken by the HRS sample are described in Table 5-8. Note that the longer the problem period, the higher the utilization rates tend to be for each type of response. This result, of course, is consistent with what one would logically expect. Imbalances that persist are obviously more difficult to resolve; therefore, more complex adjustment efforts, often involving multiple strategies, are likely to be adopted. Accordingly, protracted difficulties are characterized by a greater number of responses than short-duration problems. This is clearly shown by the Survey results. While the adjustment to imbalances lasting one year or less had a mean of 1.8 specific mechanisms, those lasting two and three years were addressed, on average, by 2.5 and 3.0 measures, respectively.

Table 5-8

Specific Responses to Shortage Situations, by Duration of Shortage, 1977-79

	Proportion of situations adjusted, by shortage duration[1]		
	One year or less	Two years	Three years
	(Per cent)		
Responded to shortages by:			
Training personnel	42.1	64.0	70.6
Overtime	31.0	40.6	47.3
Searching outside region	32.8	36.9	41.8
Lowering qualifications	21.3	30.2	29.7
Improving wages and benefits	18.0	26.3	35.4
Curtailing production	13.6	17.4	27.7
Subcontracting	10.7	18.5	23.3
Searching outside Canada	8.3	10.6	18.2
Capital substitution	2.4	2.0	3.8
	(*n*=506)	(*n*=453)	(*n*=347)

n – number of shortage situations.

1 Multiple responses to shortage situations account for the fact that, for each shortage duration, the solutions combined exceed 100 per cent.

SOURCE HRS, 1979.

Although all response measures are employed more often for enduring problems than for the shorter-term ones, Table 5-8 indicates that the utilization rates for some instruments, in particular, rise dramatically as the duration of the imbalance increases. Specific examples of this are searching outside Canada; subcontracting; improving wages and benefits; and, to a lesser extent, personnel training. The incidence of production cuts, too, bears a close relationship to the duration of the difficulty. While the use of capital substitution, overtime, lowering qualifications, and searching outside the region was also greater in the longer-term situations, these rates of increase were not as marked.

Number of vacancies – The number of those vacancies associated with the hiring difficulty also appears to have some bearing on the nature of the adjustment process. Just as adjustment strategies for long-term problems tend to involve multiple responses, imbalances affecting many positions are likely to be met by more than one instrument.[9] For example, the average number of specific measures applied by the HRS establishments to one-vacancy hiring difficulties was 1.7, while the corresponding figure for those involving two or more vacancies was 2.7.[10]

The application of particular responses by the number of vacancies associated with the imbalance is shown in Table 5-9. The first thing to notice is that while the utilization rates are much greater in cases affecting two to four positions than in those affecting only one, there is very little additional increase when situations involving five or more vacancies are considered. Although the number of positions seems to have some impact on the adjustment strategy, then, the important distinction here would appear to be simply between single- and multiple-vacancy patterns.

Table 5-9

Specific Responses to Shortage Situations, by Number of Associated Vacancies, 1977-79

	Proportion of situations adjusted, by number of vacancies[1]		
	One	Two to four	Five or more
	(Per cent)		
Responded to shortages by:			
Training personnel	42.8	60.8	70.6
Overtime	28.2	41.0	47.8
Searching outside region	30.4	37.5	41.5
Lowering qualifications	19.7	30.3	30.5
Improving wages and benefits	12.2	28.9	33.6
Curtailing production	12.0	20.7	20.4
Subcontracting	10.9	18.3	20.8
Searching outside Canada	8.4	10.4	19.0
Capital substitution	0.7	3.4	4.5
	(*n*=551)	(*n*=627)	(*n*=289)

n – number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, for each vacancy category, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

It is obvious from Table 5-9 that each of the specific mechanisms was employed more often in multiple-vacancy imbalances than in those affecting only one position. This was particularly so for capital substitution and improving wages and benefits. Search outside of the country also strongly exhibited this pattern, although it should be noted that this is the only instrument where the jump in the utilization rate only occurred in situations involving five or more vacancies.

The Type of Establishment

In understanding the adjustment strategies used, one must also consider the type of establishment facing the imbalance situation. The HRS results suggest that organizational and environmental characteristics play some role in the response to hiring difficulties. In particular, we shall look at variations in adjustment by establishment size, industry, and two aspects of geographical location.[11]

Size of establishment – The patterns of response to hiring difficulties appear to differ significantly on the basis of establishment size. In the first place, large organizations tend to employ a greater number of measures for each imbalance situation than small ones. Establishments with at least 500 workers used multiple responses in 71.9 per cent of all their hiring difficulties; on the other hand, establishments with fewer than 20 employees used them in only 51.9 per cent (Table 5-10).

Table 5-10

Single and Multiple Adjustments to Shortage Situations, by Size of Establishment, 1977-79

	Proportion of situations adjusted by:		
	A single measure	More than one measure	Total
	(Per cent)		
Establishment size (number of full-time employees):			
Less than 20	48.1	51.9	100.0
20-49	32.3	67.7	100.0
50-99	29.5	71.5	100.0
100-499	35.7	64.3	100.0
500 or more	28.1	71.9	100.0
All establishments[1]	33.7	66.3	100.0 (*n*=1,407)

n – number of shortage situations.
1 Establishment size was unavailable in the case of 118 shortage situations.
SOURCE HRS, 1979.

The utilization rates, by organizational size, for specific responses are shown in Table 5-11. These figures clearly suggest that small establishments are less able than large ones to effectively react to a lack of available skills. Strong positive relationships emerged between size and the use of overtime, search outside the region, improving wages and

Table 5-11

Specific Responses to Shortage Situations, by Size of Establishment, 1977-79

	Proportion of situations adjusted, by establishment size (number of employees)[1]				
	Less than 20	20-49	50-99	100-499	500 or more
	(Per cent)				
Responded to shortages by:					
Training personnel	56.4	57.7	66.8	51.6	56.0
Overtime	22.6	36.2	37.0	37.6	42.9
Searching outside region	21.1	28.7	35.5	40.6	52.7
Lowering qualifications	29.3	29.0	29.4	26.3	18.1
Improving wages and benefits	16.5	23.1	23.4	26.3	23.1
Curtailing production	21.8	22.2	17.7	15.0	9.3
Subcontracting	8.3	13.8	13.2	17.6	24.2
Searching outside Canada	10.5	8.2	8.7	12.0	13.7
Capital substitution	-	1.8	3.8	4.7	0.6
	(*n*=133)	(*n*=442)	(*n*=265)	(*n*=426)	(*n*=182)

n - number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, for each size category, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

benefits, and subcontracting. Only the least desired responses – lowering the job qualifications and curtailing production – were more commonly employed in small organizations.

Industry variations – The sectoral utilization rates for specific responses to hiring difficulties are presented in Table 5-12. The mining industry, more than any other, relied on multiple mechanism adjustments, and the use of a number of measures was very frequent. In fact, the rates for training, overtime, search outside the region, lowering qualifications, and subcontracting were the highest of all sectors. Improving wages and benefits, too, was a relatively significant instrument, as it was employed in about one-third of all hiring difficulties reported by mining respondents.

Although training was the most often cited mechanism in construction, this was the only industry where it was used in less than 50 per cent of the imbalance situations. Search outside the region, lowering qualifications, and overtime were also fairly important strategies. The high incidence of production curtailment should be noted as well.

Table 5-12

Specific Responses to Shortage Situations, by Industry, 1977-79

	Proportion of situations adjusted, by industry[1]						
	Mining	Construction	Manufacturing	Transportation, communications, and utilities	Trade	Finance insurance, and real estate	Services
	(Per cent)						
Responded to shortages by:							
Training personnel	70.3	43.8	60.2	55.7	61.9	50.0	53.5
Overtime	62.5	28.6	46.6	23.0	26.2	14.6	32.0
Searching outside region	68.8	34.3	35.8	42.6	25.3	35.4	36.4
Lowering qualifications	35.9	29.5	23.3	27.9	26.2	29.2	32.3
Improving wages and benefits	32.8	21.9	23.3	16.4	19.5	33.3	26.3
Curtailing production	15.6	22.9	17.8	23.0	15.9	8.3	16.2
Subcontracting	31.3	16.2	20.0	21.3	11.0	8.3	7.7
Searching outside Canada	4.7	7.6	12.1	3.3	7.0	4.2	15.8
Capital substitution	4.7	-	4.3	6.6	1.2	-	-
	(*n*=64)	(*n*=105)	(*n*=670)	(*n*=61)	(*n*=328)	(*n*=48)	(*n*=297)

n - number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, in each industry, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

The utilization rates in manufacturing were quite similar to those for the entire HRS sample (Table 5-4). The only exception was overtime, which was particularly important for manufacturers.

The HRS data suggest that imbalances pose a particular problem in transportation, communications, and utilities in terms of affecting output. Table 5-12 shows that 23 per cent of the hiring difficulties resulted in production cuts. This was the highest rate among all industries. Some more positive adjustment strategies relied upon included training and search outside the region.

Training was also prevalent in trade, as it was utilized in 61.9 per cent of that sector's hiring difficulties. Important, although to a far less degree, were overtime, lowering qualifications, and search outside the region.

The adjustment patterns in finance, insurance, and real estate emphasized training, search outside the region, improving wages and benefits, and lowering qualifications. Overtime was rarely employed as a response in this sector. In the sense of affecting production, shortages appear to have been less significant in finance, insurance, and real estate than elsewhere in the economy.

The major strategies used by services establishments were training, search outside the region, lowering qualifications, and overtime. Search outside Canada was also relatively important, as it was employed in 15.8 per cent of the sector's hiring difficulties.

Regional variations – The Survey data appear to suggest some regional variations in the response patterns to hiring difficulties. First of all, the use of single-mechanism adjustments was most common in Quebec. In fact, while about 30 per cent of the imbalances in the other regions were met by one measure, the corresponding figure for Quebec was just over 40 per cent. In terms of specific responses, Quebec establishments reported relatively low utilization rates for training, search outside the region, lowering qualifications, and improving wages and benefits (Table 5-13).

A few other regional distinctions emerge from the HRS findings on adjustment strategies. For example, the respondents in the Atlantic region tended to rely quite heavily on lowering qualifications required, but they used overtime infrequently. It should also be noted that only 2.9 per cent of the hiring difficulties in this part of the country resulted in production cuts. Although training predominated in both Ontario and the West, these two regions also had very high utilization rates for overtime and search outside the region, respectively.

Size of locality – The last dimension to be considered in this section is the size of the locality in which the organization is located. As Table 5-1 indicates, reliance on training, overtime, lowering qualifications, subcontracting, and capital substitution does not seem to be affected by the population of the establishment site. Improving the employment package and searching outside the country, however, were both used more often by firms in large centres

Table 5-13

Specific Responses to Shortage Situations, by Region, 1977-79

	Proportion of situation adjusted, by region[1]			
	Atlantic region	Quebec	Ontario	The West
	(Per cent)			
Responded to shortages by:				
Training personnel	63.5	49.1	62.1	58.1
Overtime	24.0	33.3	42.1	36.6
Searching outside region	34.6	29.2	31.6	42.4
Lowering qualifications	42.3	21.7	26.7	27.2
Improving wages and benefits	25.0	19.2	27.5	21.2
Curtailing production	2.9	15.7	18.1	19.8
Subcontracting	10.6	10.7	18.6	16.4
Searching outside Canada	3.8	9.7	12.0	10.8
Capital substitution	2.9	0.6	3.4	2.7
	(*n*=104)	(*n*=318)	(*n*=585)	(*n*=566)

n – number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, for each region, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

Table 5-14

Specific Responses to Shortage Situations, by Population of Establishment Site, 1977-79

	Proportion of situations adjusted, by population of site[1]			
	Less than 20,000	20,000 to 99,999	100,000 to 499,999	500,000 or more
	(Per cent)			
Responded to shortages by:				
Training personnel	57.7	64.2	67.4	53.1
Overtime	34.4	35.2	34.5	38.9
Searching outside region	45.1	37.4	34.8	29.7
Lowering qualifications	25.5	24.0	31.5	26.8
Improving wages and benefits	17.4	21.2	27.3	24.0
Curtailing production	11.0	14.5	16.5	21.0
Subcontracting	17.4	15.6	15.0	14.2
Searching outside Canada	5.7	11.2	10.9	12.1
Capital substitution	1.9	1.7	2.6	3.1
	(*n*=317)	(*n*=179)	(*n*=267)	(*n*=787)

n - number of shortage situations.
1 Multiple responses to shortage situations account for the fact that, for each population category, the solutions combined exceed 100 per cent.
SOURCE HRS, 1979.

than by those in small ones. On the other hand, search outside the region was inversely related to locality size. Establishments in relatively unpopulated areas presumably do not have access to the labour supplies available in major markets; accordingly, they must be more willing to extend the limits of their search for skilled workers. Despite the resources available, though, companies situated in large centres reported higher incidences of production cuts than those in small locales.

Summary

In this chapter, the issue of establishment responses to labour imbalances has been addressed. Adjustment strategies can focus on increasing the supply of needed workers, reducing the demand, or some combination of both. A wide range of instruments are available to firms; and, theoretically at least, their decisions will be based on minimizing costs, subject to any constraints imposed by the relevant actors in the environment, such as governments, unions, and the workers themselves.

The Human Resources Survey collected information on adjustments taken by participating establishments in response to the hiring difficulties they experienced during the period from 1977 to 1979. In the majority of imbalance situations, more than one specific mechanism was employed by firms in reacting to the problem. For the most part, supply-oriented responses predominated. Measures particularly relied upon were personnel training and, to a lesser extent, overtime and search outside the region. In light of the traditional analytical focus on the role of wages in adjustment, it is interesting to note that improving the employment package was a response of only minor importance among the Survey participants. Recruiting outside the country, too, was of little significance in meeting hiring difficulties.

The HRS results suggest that adjustment strategies vary significantly according to the nature of the hiring difficulty and the type of establishment facing the problem. Along the former dimension, the kinds of skills required, the duration of the imbalance, and the number of associated vacancies all appeared to have some bearing on the response taken. Variations in adjustment patterns also emerged on the basis of a number of establishment characteristics including size, industry, and geographical locations.

Part 3

Human Resource Programs

6 Searching for Skilled People

Up to this point, the presentation of the Human Resources Survey findings has focused exclusively on skill shortages. In the preceding chapters, the dimensions of the imbalances were identified, and resulting adjustment processes were discussed. The data collected by the HRS are not limited, however, merely to the domain of shortages. Emphasis was also placed on the on-going human resource programs in industry. Certainly, a motivating factor for the Survey was to find out what establishments do, on a regular basis, to meet the personnel requirements in their operations.

Essentially, there are two ways in which a company can attempt to meet its occupational needs. It can search for already skilled workers, and it can train previously unqualified people. These two strategies, together, are the topic of discussion in this section of the study. The search patterns of the Survey respondents are considered briefly in this chapter; their training experiences are discussed in detail in the next.

Sources of Skilled Labour

In order to obtain some information on recruiting in industry, the Survey establishments were asked to identify sources of skilled labour important to them. It should be emphasized that the interest here is on search patterns that are *regularly* employed rather than on those specifically invoked in response to shortage situations.[1] Before turning to the Survey results, it should also be noted that the data presented in this chapter pertain to the recruitment of *skilled labour* only; managerial, professional, and other office personnel were not included in this aspect of the inquiry.

Table 6-1 shows the importance of different skilled labour sources for the HRS respondents. From these figures, it is evident that the local labour market predominates. Approximately two-thirds of the establishments surveyed indicated that this was a major recruiting source. In fact, in many cases, the search for skilled workers appears to be limited only to the local labour market. Among the establishments citing the local market, 48 per cent reported no other significant sources of qualified labour. As will be seen in the rest of this chapter, the reliance on the local labour market was universal in the sense of being commonly identified by all types of respondents.

The education system constitutes the second most important source of skilled labour for the HRS establishments. As Table 6-1 shows, community colleges played a significant part in the recruiting programs of 31.9 per cent of the establishments; vocational secondary schools, in those of 24 per cent. To some extent, these two sub-samples include the same companies, as half of those using the secondary schools also considered the community colleges an important search target.

Table 6-1

Sources of Skilled Labour, 1979

	Proportion of establishments that cited each source
	(Per cent)
Local labour market	67.2
Community colleges and CEGEPs	31.9
Vocational secondary schools	24.0
Other parts of Canada	11.4
Private training institutions	9.2
Unions and employee associations	8.5
Outside Canada	7.5
	(*n*=1,354)

n – number of establishments.

SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

The Survey data suggest that the vast majority of firms do not rely on casting a wide net to meet regular recruiting needs. In identifying important sources, only 11.4 per cent of the respondents cited other parts of Canada, and it will be seen that much of this interregional search was carried out by establishments in the western provinces. Hiring skilled labour from other countries was also a relatively uncommon strategy among the participating companies, as it was reported by just 7.5 per cent of those surveyed. Not unexpectedly, the firms that recruit

offshore also exhibited a greater than average tendency to search in other parts of the country for skilled labour.

Finally, private training institutions and unions or employee associations both appear to be suppliers of minor significance to Canadian employers as a whole. The data suggest, however, that each of these assumes a more critical role in certain sectors of the economy. For example, private institutions were reported to be a relatively important source for mining establishments; unions were regularly cited by construction respondents.

Search Patterns

As one might expect, there are some variations within the HRS sample in terms of the sources of skilled labour. As examples of this, one can point to regional and sectoral differences in search patterns. Similarly, the Survey data suggest that large or well-paying establishments do not utilize the same approaches to recruiting as their smaller or poorer-paying counterparts.[2] In this section, we shall consider briefly some of these variations.

Regional Variations

The sources of skilled labour for the HRS establishments are presented, by region, in Table 6-2. Certainly, many of the search patterns described in the previous section were reported by respondents in all parts of the country. For example, in each of the four regions, the local labour market was unquestionably the dominant focus of recruiting activity. Consistent, too, were results indicating that looking outside of Canada was a hiring strategy of only minor importance.

These observations notwithstanding, the data do suggest some regional variations in the sources of skilled labour. A case in point is the reliance on vocational secondary schools reported by establishments in the Atlantic region. While slightly fewer than one-quarter of the overall sample identified this as an important source, the corresponding figure among respondents in the Atlantic region was 45.1 per cent. Of relatively minor significance in this part of the country were the community colleges.

Although the local labour market clearly plays a central role in the recruiting habits of companies across Canada, nowhere was it more often mentioned than in Quebec, where three out of every four respondents identifed it as a major source of skilled labour. In comparison with the other regions, though, Quebec establishments attach only minor significance to the vocational secondary schools. Hiring from other parts of the country, too, appears to be relatively unimportant here, as only 4.1 per cent of the province's firms cited this source.

Recruiting patterns reported by the Ontario subsample were quite similar to those characterizing Canada as a whole. The major deviation that emerged from the data was the reliance within the province on community colleges. While 31.9 per cent of the national sample cited this source, the corresponding figure for Ontario was 39.6 per cent.

The local labour market was the focal point for recruiting skilled labour in all of the western provinces. There were intraregional variations, however, in the degree to which this source was cited, ranging from 71 per cent of the establishments in Manitoba to only 51 per cent of those in Saskatchewan. As one might expect, the reliance on finding skills in other parts of the country was much higher for western firms than for those in the Atlantic, Quebec, or Ontario regions. Much of this extended search was reported by establishments in Alberta and, to a lesser

Table 6-2

Sources of Skilled Labour, by Region, 1979

	Proportion of establishments that cited each source			
	Atlantic region	Quebec	Ontario	The West
	(Per cent)			
Local labour market	62.6	74.9	64.1	65.2
Community colleges and CEGEPs	16.5	30.3	39.6	26.0
Vocational secondary schools	45.1	17.9	20.4	30.1
Other parts of Canada	8.8	4.1	8.6	23.5
Private training institutions	7.7	12.4	8.2	8.0
Unions and employee associations	2.2	6.9	6.9	14.1
Outside Canada	2.2	5.0	9.7	8.3
	(*n*=91)	(*n*=363)	(*n*=538)	(*n*=362)

n - number of establishments.
SOURCE HRS, 1979.

extent, in British Columbia. In the former province, 30 per cent of the respondents cited this source; in the latter, 18 per cent. Finally, companies in the West included unions for their recruiting more often than those elsewhere in the country. This was particularly true in British Columbia, where 23 per cent of the HRS firms attached importance to employee organizations as a supplier of skills.

Sectoral Variations

The Survey results on the sectoral patterns of finding qualified workers are shown in Table 6-3. Looking first at mining, it is evident that this industry relies upon a diverse mix of sources in order to meet its personnel requirements. Although the local labour market was most often cited, it does not assume the dominance that is obvious in many of the other sectors. No doubt, this is at least partly because of the location of many mining establishments in relatively remote areas, which naturally lack a developed local labour market. Other important sources of skilled labour for the industry were vocational secondary schools, community colleges, other parts of Canada, and private training institutions.

The most distinctive feature characterizing recruiting in construction is the central role played by unions and employee associations. This was reflected in the HRS results, as 38.2 per cent of the contractors surveyed identified unions as an important channel for hiring. Only the local labour market was more often reported as a source of skilled labour in this industry. Of relatively minor significance to construction operators was the education system, as both community colleges and vocational secondary schools were cited at frequencies well below the all-industry levels.

The use of the local labour market to meet personnel needs was greater among manufacturers than elsewhere in the economy. As Table 6-3 shows, 78.3 per cent of the respondents in this sector reported a reliance on this source. Closer analysis indicates that all types of manufacturing followed this pattern. In other respects, the recruiting habits of manufacturers resembled those of the HRS sample as a whole. There were, however, some variations within the sector. For example, electrical equipment and chemical establishments tended to use community colleges; textile and apparel operations did not. Similarly, recruiting outside the country was relatively important in textiles and transportation equipment. On the other hand, not a single establishment in either food and beverages or stone, clay, glass, and concrete cited this source.

Finding skilled labour in the transportation, communication, and utilities sector also centred around the local labour market. The only other source of any significance reported by the HRS sample in this sector was the community college system. Vocational secondary schools were of relatively minor importance here.

For the most part, the recruiting patterns within trade were similar for both wholesalers and retailers. The local labour market was by far the dominant reservoir of skills, with secondary reliance on the education institutions. The other sources were of very minor significance in this sector.

Table 6-3

Sources of Skilled Labour, by Industry, 1979

	Proportion of establishments that cited each source						
	Mining	Construction	Manufacturing	Transportation, Communication, Utilities	Trade	Finance Insurance, Real Estate	Service
				(Per cent)			
Local labour market	58.6	61.8	78.3	67.4	65.2	72.5	54.4
Community colleges and CEGEPs	37.9	17.3	32.1	29.1	27.8	35.3	42.1
Vocational secondary schools	41.4	17.3	22.6	14.0	27.5	31.4	24.4
Other parts of Canada	31.0	10.9	12.4	14.0	5.1	19.6	13.4
Private training institutions	24.1	7.3	5.9	11.6	8.2	19.6	12.4
Unions and employee associations	10.3	38.2	8.1	5.8	2.8	3.9	6.0
Outside Canada	6.9	5.5	10.4	3.5	5.7	2.0	8.5
	(*n*=29)	(*n*=110)	(*n*=442)	(*n*=86)	(*n*=353)	(*n*=51)	(*n*=283)

n – number of establishments.
SOURCE HRS, 1979.

Nearly three-quarters of the establishments in finance, insurance, and real estate identified the local labour market as important for recruiting skilled workers. Community colleges, vocational secondary schools and, to a lesser extent, other parts of Canada and private training institutions were also cited as sources of some significance.

Reliance on the local labour market was lower in the service sector than in any other; nevertheless, the majority of respondents in the industry indicated that they recruited skilled workers from their own locality. Community colleges were a major source, as they were identified by 42.1 per cent of the service respondents. In particular, the health and education and social services were dependent on the colleges to supply qualified people.

Establishment Size

Firms with major operations tend to have greater personnel requirements (in terms of numbers and, often, complexity); thus, they are likely to have a more difficult task in meeting those needs. It is not surprising, then, that the large organizations participating in the HRS exhibited more developed recruiting patterns than did small respondents. In fact, as Table 6-4 indicates, the level of reliance on virtually all sources of skilled labour was positively correlated with establishment size. For example, respondents with at least 500 employees were about five times more likely to cite other parts of Canada as an important source than companies with less than 20 employees. Similarly, the use of private training institutions was three times as high within the former sub-sample, while community colleges, vocational secondary schools, and offshore sources were eac twice as often cited by the largest employers as b the smallest.

Establishment Pay

As Table 6-5 suggests, establishments reportir high levels of wages and salaries exhibit differe patterns of hiring skilled labour than those wi inferior rates of compensation. More specifically, th HRS data indicate that the less a firm paid, the mo likely it was to focus its recruiting efforts solely on th local labour market. As one considers establishmen with successively higher levels of employee earning however, the importance of the local market dim nishes, while the emphasis on alternate sources qualified personnel clearly increases. From Table 6- it can be seen that, among the Survey respondent there was a significant positive relationship betwe rates of compensation and reliance on the educati system, extended search, private training institution and unions to provide needed personnel. Presur ably, high-paying firms have relatively advanced sk requirements, and in many cases these cannot met with the resources available in the local labo market.

Summary

In this chapter, we looked briefly at the recruiti patterns employed by the respondents in order meet regular skilled labour requirements. The Surv results clearly point to the predominant role play by the local market, as about two-thirds of t participating establishments identified this as

Table 6-4

Sources of Skilled Labour, by Size of Establishment, 1979

	Proportion of establishments that cited each source, by size (number of employees)[1]				
	Less than 20	20-49	50-99	100-499	500 or mor
			(Per cent)		
Local labour market	61.1	67.9	71.7	71.4	78.1
Community colleges and CEGEPs	25.5	25.4	32.6	46.6	50.7
Vocational secondary schools	15.9	20.7	27.8	31.2	37.0
Other parts of Canada	4.8	9.8	8.7	19.2	27.4
Private training institutions	5.8	8.7	9.6	10.7	20.6
Unions and employee associations	7.7	7.7	10.4	6.8	11.0
Outside Canada	4.8	6.1	7.8	12.8	11.0
	(*n*=208)	(*n*=492)	(*n*=230)	(*n*=234)	(*n*=73)

n - number of establishments.

1 Size data were unavailable for 117 establishments.

SOURCE HRS, 1979.

Table 6-5

Sources of Skilled Labour, by Average Establishment Pay, 1979

	Proportion of establishments that cited each source, by average weekly pay			
	Less than $200	$200–299	$300–399	$400 or more
	(Per cent)			
Local labour market	77.0	71.4	71.0	56.5
Community colleges and CEGEPs	23.0	33.4	29.0	32.9
Vocational secondary schools	18.0	23.3	24.0	28.6
Other parts of Canada	4.0	7.5	10.8	23.6
Private training institutions	4.0	10.2	10.4	9.9
Unions and employee associations	1.0	4.8	7.9	21.1
Outside Canada	4.0	5.6	9.3	11.2
	(*n*=100)	(*n*=374)	(*n*=279)	(*n*=161)

n – number of establishments.
SOURCE HRS, 1979.

central source for hiring qualified workers. The community college and vocational school systems were reported to be of secondary significance, while extended search, private training institutions, and unions assumed relatively minor importance in the sample's recruiting strategies.

Variations in the sources of skilled labour were the focus of the second half of the chapter. The information collected suggests some regional differences in the patterns reported. For example, the respondents from the Atlantic region cited a great reliance on vocational secondary schools, while those from the West identified other parts of Canada as a relatively major source. Similarly, some sectoral patterns emerged from the data. Establishments in the mining industry, for example, used a diverse mix of sources; manufacturers, on the other hand, tended to rely heavily on the local labour market. Community colleges were reported to be particularly important in the service sector, and unions and employee associations occupied a similar role in construction.

Finally, the links between sources of skilled labour and certain organizational variables were addressed. Relationships were evident when establishment size and level of pay were considered. Large organizations reported more developed recruiting patterns, as they cited all sources of skilled labour more often than their smaller counterparts. The influence of the level of pay, on the other hand, was slightly more complex. While firms with low wages and salaries tended to focus their hiring on the local labour market, those reporting higher levels of compensation emphasized alternate sources, with less reliance on the local market.

7 Developing Skilled People

A major focus of the Human Resources Survey was on the development of occupational skills within industry. Information in this area is of general importance for at least two reasons. First, private sector training is a significant generator of skills and must therefore be considered if accurate occupational supply data are to be developed. Second, an understanding of the existing training effort within industry would appear to be an advisable starting point for designing appropriate public programs.

Despite considerations such as these, there has not been much information gathered on the development of vocational skills in industry. This is particularly true of activity that has been carried out without any public assistance.[1] And, as will be noted in this chapter, only a small portion of training in industry has any government involvement.

Vocational training, of course, has emerged as a particularly critical issue within the context of current and anticipated labour demand. Diminishing foreign supplies, an aging work force, and changes in the nature of economic activity dictate that Canada's capabilities for developing occupational skills must increase in the near future. And the importance of gathering information on training in industry must grow accordingly. In this chapter, the training data collected by the HRS are presented. The first two sections consider the extent of skill development activities among the establishments surveyed. Barriers to training are discussed in the third section, while the types of programs carried out are described in the final section.

The Incidence of Training

The existing empirical evidence regarding the extent of training in the private sector comes, for the most part, from a series of Statistics Canada (formerly Dominion Bureau of Statistics) inquiries carried out in 1963, 1965, and 1969-70, and from a 1979 survey conducted for the Commission of Inquiry on Educational Leave and Productivity.[2] Since the first two Statistics Canada endeavours covered four industries only, we shall limit our remarks here to the results of the 1969-70 study and to those derived from the work of the Commission.[3]

Despite definitional inconsistencies and the 10-year time difference, these two surveys paint similar pictures regarding the extent of industrial training.[4] First of all, both concluded that occupational development programs were not widespread among the organizations surveyed. About 28 per cent of the Commission's respondents reported training, while the corresponding figure in the Statistics Canada inquiry was 23 per cent. Moreover, most of the training that was reported in the two surveys was of very short duration, leading one to conclude that the transmission of comprehensive skill packages did not play a major role in the overall effort.

In addition to providing another benchmark, the Human Resources Survey offers a somewhat different approach to looking at the training effort in industry. In the first place, compared with the earlier inquiries, the HRS uses a wide definition of training that encompasses informal as well as formal activity. While the Statistics Canada and the Commission efforts were essentially limited to formal programs exclusively designed for skill development, the HRS defined appropriate training simply as "the worker's acquisition of vocational skills to directly improve future productivity."[5] The only stated exclusions were safety and orientation training. By using this approach, it was intended that the Survey could tap the informal component of skill development. Admittedly, this type of activity cannot be defined clearly; so, inevitably, there are questions regarding its measurement. Indeed, it is quite probable that the methodology employed results in an overstatement of the incidence of private sector training. Nevertheless, regardless of the estimation problems, it must be recognized that informal training does represent a significant share of the total skill development effort within industry; accordingly, an attempt has been made to incorporate it.

The other notable aspect of the HRS approach to vocational training rests with its consideration of the occupational dimension. In contrast to other projects,

the Survey collected and organized the data according to the Canadian Classification and Dictionary of Occupations. Since this is the predominant system for presenting manpower information, the HRS training results, then, can be considered in terms of other labour market data.

The general commitment to training among the HRS respondents is shown in Table 7-1. Over 60 per cent of the participating establishments reported that they had carried out some vocational training during the 12-month period preceding the Survey.[6] While this figure would appear to indicate an unexpectedly high incidence of skill training in industry, closer investigation reveals that much of this effort involved very short-term programs. When longer-duration training is considered exclusively, the Survey results depict a much lower level of vocational development within industry. As Table 7-1 shows, many of the firms that reported training had carried out only very brief schemes. In fact, only slightly more than one-third of all respondents instituted programs of at least three months' duration.

Table 7-1

The Incidence of Vocational Training, 1979

	Proportion of establishments that reported training
	(Per cent)
Some training	61.7
Training programs lasting:	
At least three months	35.1
At least one year	20.3
At least two years	14.6
	(*n*=1,354)

n - number of establishments.
SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

Of course, the acquisition of many vocational skills requires preparation for at least one year (and often considerably longer). When only protracted efforts such as these are considered, the incidence rates drop considerably more. Among the establishments surveyed, just 20.3 per cent reported training programs lasting at least one year, and 14.6 per cent carried out programs designed to last two years or more.

Variations in the Incidence of Training

While the majority of firms responding to the HRS, then, reported some vocational training, the incidence of establishments carrying out long-term programs was relatively low. This overall pattern, however, is not always applicable when certain sub-samples are considered, and we shall now turn to some of the variations.

Regional Variations

According to the HRS results, establishments in Western Canada are more likely to institute vocational training than firms located elsewhere in the country. As Table 7-2 indicates, 72.7 per cent of the respondents from this region reported some skills development activity. While the Ontario and Atlantic region sub-samples exhibited incidence rates that were just slightly lower, the frequency in Quebec was far below the national average, as only 43 per cent of that region's respondents cited some training during the preceding 12 months.

Table 7-2

The Incidence of Vocational Training, by Region, 1979

	Number of establishments	Proportion of establishments that reported: Some training	Proportion of establishments that reported: Training programs lasting at least one year
		(Per cent)	
Atlantic region	90	60.0	22.2
Quebec	363	43.0	6.7
Ontario	538	67.5	22.5
The West	363	72.7	30.3
Canada	1,354	61.7	20.3

SOURCE HRS, 1979.

In terms of long-term training, a similar regional pattern emerged. In the West, 30.3 per cent of the participants reported programs of at least one year's duration; the corresponding figure in Quebec was only 6.6 per cent. Once again, Ontario and the Atlantic region fit in between, close to the national average.

Industry Variations

The incidence of training, by industry, is shown in Table 7-3. The results indicate that establishments in finance, insurance, and real estate and in mining were more likely to carry out some training activity than their counterparts in the other sectors. In both of these industries, roughly four out of five firms instituted some training. The lowest incidence rates were in construction and in transportation, communication, and utilities; only about one-half of these respondents reported any vocational development programs.

Table 7-3

The Incidence of Vocational Training, by Industry, 1979

	Number of establishments	Proportion of establishments that reported: Some training	Training programs lasting at least one year
		(Per cent)	
Mining	29	79.3	27.6
Construction	110	52.7	30.9
Manufacturing	442	68.1	27.8
Transportation, communication, and utilities	86	48.8	12.8
Trade	353	58.6	17.8
Finance, insurance, and real estate	51	84.3	21.6
Services	283	56.9	8.8
All industries	1,354	61.7	20.3

SOURCE HRS, 1979.

Despite having a low training incidence rate, construction ranked first among all industries with respect to carrying out long-term training. As Table 7-3 indicates, 30.9 per cent of the Survey establishments in that sector reported programs lasting at least one year. Most of this activity was carried out by the general building and special trade contractors. After construction, manufacturing and mining had the highest levels of long-term training. Within manufacturing, programs lasting at least one year were particularly prominent in operations producing electrical equipment, transportation equipment, machinery, lumber and wood products, and paper products.

Although 84.3 per cent of the establishments in finance, insurance, and real estate instituted some training, it is evident that much of the effort in this sector was of a short-term nature. Only slightly more than one-fifth of the industry's respondents undertook programs of at least one year's duration.

A relatively low incidence of long-term training was reported by firms in trade, in transportation, communication, and utilities, and in services. Within these three sectors, the only sub-industry with a significant amount of comprehensive skill development was automotive and gasoline retailing.

Establishment Size

The larger the establishment, the more likely it was to institute some vocational training. No doubt this reflects the greater resources and skill requirements associated with increased organizational size. In Table 7-4, only 42.8 per cent of the respondents with less than 20 employees reported some training, while the corresponding figure among those with 500 or more employees was 93.2 per cent.

Table 7-4

The Incidence of Vocational Training, by Establishment Size, 1979

	Number of establishments	Proportion of establishments that reported: Some training	Training programs lasting at least one year
		(Per cent)	
Establishment size (number of full-time employees):			
Less than 20	208	42.8	9.1
20-49	492	59.4	18.3
50-99	230	63.9	21.3
100-499	234	77.8	27.4
500 or more	73	93.2	46.6
All establishments[1]	1,237	62.9	20.7

1 Size information was unavailable for 117 establishments.
SOURCE HRS, 1979.

Long-term training, too, tended to be carried out much more often by large establishments than by small ones. While fewer than 10 per cent of the firms with less than 20 employees reported programs lasting at least one year, this incidence increased until it reached 46.6 per cent in the case of 500 or more employees.

Establishment Pay

The HRS results suggest that the link between the level of establishment pay and the vocational training effort is a somewhat complicated one. As Table 7-5 indicates, whether or not a firm carries out *any* skill development does not really seem to be significantly influenced by the rate of employee compensation. That is, low-paying respondents were just as likely to report some training as their higher-paying counterparts. On the other hand, the incidence of long-term training was clearly related to wage/salary levels. Table 7-5 shows that only 6 per cent of the respondents in the under-$200 compensation category carried out programs lasting at least one year. As successively higher-paying firms are considered, however, this incidence rate rises; 30.4 per cent of those respondents in the $400-and-over group undertook long-term training.

Table 7-5

The Incidence of Vocational Training, by Establishment Pay, 1979

	Number of establishments	Proportion of establishments that reported: Some training	Training programs lasting at least one year
		(Per cent)	
Establishment pay (average gross weekly wage/salary for full-time personnel):			
Less than $200	100	56.0	6.0
$200-$299	374	57.8	13.9
$300-$399	279	68.5	26.5
$400 or more	161	62.1	30.4
All establishments[1]	914	61.6	19.8

1 Pay information was not available for 440 establishments.
SOURCE HRS, 1979.

Other Organizational Characteristics

In order to get a more complete picture, our analysis regarding the propensity to train also considered a number of other organizational characteristics including age, the population of the establishment site, and union status. No clear patterns emerged, however, to describe the impact of these variables on the incidence of training.

With respect to establishment age, very young respondents (i.e. those in operation less than five years) reported the lowest training rates. Among all other organizations, however, no relationship was apparent between age and skill development activity. In terms of the population of the establishment site, the most notable observation was that firms in large metropolitan areas (i.e. areas with 500,000 people or more) were less likely to carry out long-term training than those located in smaller centres or in rural regions. No doubt this simply reflects the greater pool of skilled labour available in the former markets.

Finally, within the sample, the training rates among unionized firms were generally very similar to those in the non-union sector. Of course, an adequate picture of union participation in skill development cannot be drawn from an establishment survey such as the HRS. Detailed information on the role of employee associations in the design and implementation of programs would be of great value. For its collection, however, other research approaches would be necessary.

Training Deterrents

As noted, many firms do not train and, of those that do, the vast majority carry out only short-term programs. Inevitably, these findings raise the question of why a greater training effort does not exist within industry. In order to briefly consider this issue (which undoubtedly deserves a great deal more attention), respondents to the Human Resources Survey were asked to identify significant barriers to training.[7]

The importance placed on the particular deterrents included in the questionnaire is described in Table 7-6.[8] The responses are presented for two HRS subsamples: one includes those establishments that reported no training activity whatsoever; the other is composed of firms carrying out only short-term programs (i.e. of less than one year's duration).

Table 7-6

Deterrents to Training, 1979

	Proportion of establishments that cited deterrents: Non-training establishments	Establishments that provide short-term training only
	(Per cent)	
Vacancies can generally be filled by outside hiring	51.4	36.1
Workers leave during or after the training period	17.0	36.1
Adequate financial resources do not exist to develop or implement programs	19.1	30.3
In-company training hinders production	11.6 (*n*=519)	27.1 (*n*=560)

n = number of establishments.
SOURCE HRS, 1979.

As for the non-trainers, the major deterrent, by far, was the fact that vacancies could generally be filled by hiring outside personnel who already had the required skills. This factor was cited by 51.4 per cent of the respondents in this group. For just over half of the non-training establishments, then, an important reason for not undertaking any training was simply that there was no perceived need. None of the other deterrents appeared to play a significant role.

While the non-trainers, then, focused on the lack of a *need* to institute training, the short-term trainers were directed more towards problems associated with *carrying out* programs (Table 7-6). This difference in responses may be explained in at least two ways. First, it is possible that, unlike the non-trainers

the establishments carrying out only short-term training did not have skill requirements of the type that could generally be filled solely through recruiting. And, second, having already undertaken some training, presumably the short-term trainers were more aware of potential problems related to turnover, cost, and production.

Before leaving the question of why firms do not institute training (particularly long-term training), perhaps the critical role of personnel forecasting should be mentioned.[9] Inevitably, a gestation period must be associated with the transmission of vocational skills. In order to effectively utilize training programs as a means of meeting occupational requirements, then, establishments must be able to anticipate these future needs some time in advance. Obviously, in the case of long-term training, forecasting would seem to be particularly important.

This close association between human resource planning and vocational training is evident from the HRS data (Table 7-7). While only 46.2 per cent of the non-training respondents were engaged in any forecasting activity, approximately 66 per cent of the training firms reported some personnel planning.[10] Surprisingly, though, the incidence of planning among long-term trainers was only slightly higher than that characterizing the short-term sub-sample.

Table 7-7

The Incidence of Forecasting, by Type of Training Establishment, 1979

	Number of establishments	Proportion of establishments that did some forecasting
		(Per cent)
Non-training establishments	519	46.2
Establishments that provide:		
Short-term training only	560	65.0
Long-term training	275	67.6
All establishments	1,354	58.3

SOURCE HRS, 1979.

A Description of Training Programs

In the remainder of this chapter, we shall look at the types of training instituted by the HRS respondents during the 12 months preceding the Survey. Included will be accounts of the skills acquired by training, the duration, methods and costs of the programs, and the participation of government. While this discussion will incorporate both apprenticeship and non-apprenticeship activities, the section will also include a separate summary description of the apprenticeship programs reported.

Occupations Trained

Two measures are used to indicate the occupational dimension of the training effort reported by the Survey respondents. The first of these is the distribution of programs (Table 7-8); the second is the composition of trainees (Table 7-9).[11]

Table 7-8

Training Programs, by Major Occupational Group, 1979

	Proportion of programs carried out
	(Per cent)
Product fabricating and repair	19.4
Clerical	16.4
Sales	11.4
Managerial	10.8
Machining	8.8
Sciences and engineering	5.9
Service	5.3
Processing	5.2
Construction trades	4.2
Other	12.6
All occupations	100.0 (n=2,572)

n – number of programs.
SOURCE HRS, 1979.

Table 7-9

Estimated Number of Trainees, by Major Occupational Group, 1979

	Estimated trainees	
	Number	Proportion of total
		(Per cent)
Sales	3,401	17.1
Product fabricating and repair	2,918	14.6
Clerical	2,379	11.9
Managerial	2,122	10.6
Medicine and health	1,636	8.2
Machining	1,183	5.9
Processing	1,155	5.8
Mining	845	4.2
Service	785	3.9
Other	3,507	17.8
All occupations	19,931	100.0

SOURCE HRS, 1979.

Both of these indicators show the focus of training on the product fabricating and repair, clerical, sales, and managerial categories. Tables 7-8 and 7-9 show

that 58 per cent of the programs and 54.2 per cent of the trainees fell into these four major occupational groups (2-digit CCDO).

The product fabricating and repair occupations accounted for 19.4 per cent of the programs and 14.6 per cent of the trainees reported by the participating establishments. Within product fabricating and repair, the training effort was greatest for machinery mechanics, as this unit occupation (4-digit CCDO) accounted for 27 per cent of the group's programs and about 33 per cent of its trainees. Important, albeit to a lesser extent, was the development of motor vehicle mechanics, equipment electricians, and sewing machine operators.

Clerical skills, too, constituted a major focus of training activity. Over 25 per cent of the clerical programs were instituted for accounting clerks, while secretaries and EDP equipment operators evenly shared another 30 per cent. In terms of numbers of trainees, though, the clerk-typist category was most important, as 23 per cent of the clerical trainees fell into this unit occupation.

The development of sales personnel accounted for 11.9 per cent of the training programs and 17.1 per cent of the trainees reported by the Survey respondents. The latter figure was the highest of all the major occupational groups (Table 7-9). Commodity sales supervisors were the target of 21 per cent of all sales training programs; the share for commercial travellers, commodity salespersons, technical salespersons, and sales clerks exceeded 10 per cent each. Over 25 per cent of the trainees in sales were clerks, while commodity supervisors and salespersons accounted for 16 and 15 per cent, respectively.

The other major focus of training was the managerial group, which accounted for approximately 10 per cent of the total training effort according to both indicators. Specific occupations of importance in this category were accountants (18 per cent of the programs, 19 per cent of the trainees), production managers (11 per cent of the programs, 12 per cent of the trainees), and medicine and health administrators (17 per cent of the trainees).

The Survey results suggest that, compared with the four groups discussed above, the development of skills in the other occupational categories occurs on a relatively limited scale. Within machining, close to half of the training effort was spent on machinists and welders. Not unexpectedly, the transmission of sciences and engineering skills was not widely cited. The training that was reported within this group tended to involve technical and technological personnel, such as engineering technologists and systems analysts/programmers.

While the contributions of the other occupational groups were quite minor, in terms of the number of trainees, the share of the medicine and health occupations is worthy of note. This group accounted for 8.2 per cent of all of the trainees reported by the HRS respondents. Nearly three-quarters of this effort involved the training of nursing assistants and graduate nurses.

Table 7-10

Training Programs, by Major Occupational Group and by Industry, 1979

	Proportion of programs carried out, by industry							
	Mining	Construction	Manufacturing	Transportation, Communication, Utilities	Trade	Finance Insurance, Real Estate	Services	All industries
	(Per cent)							
Product fabricating and repair	17.7	4.8	26.6	13.4	26.4	0.8	5.4	19.4
Clerical	15.1	14.4	10.9	23.2	17.4	30.6	22.4	16.4
Sales	–	2.4	5.7	8.0	28.1	34.7	2.5	11.4
Managerial	5.0	13.6	9.4	5.4	6.4	28.1	16.7	10.8
Machining	3.4	10.4	18.5	2.7	2.5	–	0.6	8.8
Sciences and engineering	16.0	1.6	7.7	6.3	2.0	2.5	6.3	5.9
Service	0.8	–	0.3	1.8	8.7	0.8	16.3	5.3
Processing	3.4	–	11.0	–	2.8	–	–	5.2
Construction trades	3.4	45.6	2.9	6.3	0.5	0.8	1.5	4.2
Other	35.2	7.2	7.0	32.9	5.2	1.7	28.3	12.6
All occupations	100.0 (*n*=119)	100.0 (*n*=125)	100.0 (*n*=1,019)	100.0 (*n*=112)	100.0 (*n*=598)	100.0 (*n*=121)	100.0 (*n*=478)	100.0 (*n*=2,57

n – number of programs.
SOURCE HRS, 1979.

To conclude this description of the types of skills developed in industry, a sectoral breakdown of the occupations trained is presented in Table 7-10. It should be mentioned that these figures pertain to training programs rather than numbers of trainees. Looking at mining first, it will be seen that the largest share was held by the residual category, which, in this industry, was dominated by the mining occupational group. This category, by itself, accounted for over one-quarter of the sector's training programs. Programs involving product fabricating and repair, sciences and engineering, and clerical personnel were also significant.

The training effort within construction was dominated by undertakings instituted to develop construction trades skills. As Table 7-10 indicates, this occupational group accounted for 45.6 per cent of all programs reported in this sector. The rest of the activity carried out by contractors tended to fall into the clerical, managerial, and machining categories.

Among manufacturers, product fabricating and repair and machining, together, were the focus of training activity. These two groups accounted for 45.1 per cent of all programs instituted by respondents in this sector. The transmission of processing, clerical, and managerial skills each represented about 10 per cent of the total effort reported by manufacturing establishments.

The most often trained occupation in transportation, communication, and utilities was the clerical group; nearly 25 per cent of this sector's programs involved skills included in this category. Next in importance were the transport equipment operation and the product fabricating and repair groups, which accounted for 16.1 per cent and 13.4 per cent of the training reported, respectively.

As would be expected, respondents in trade identified the development of sales skills as the most common type of training carried out. The product fabricating and repair group was also prominent, largely because of the high incidence of programs for motor vehicle mechanics reported by automotive and gasoline retailers.

Virtually all of the training instituted by establishments in finance, insurance, and real estate fell into three occupational categories: sales, clerical, and managerial. In fact, as Table 7-10 indicates, these three groups, together, accounted for 93.4 per cent of the programs reported in this industry.

Within the services sector, 22.4 per cent of the training activity involved the transmission of clerical skills. Next in importance were the managerial, service, and medicine and health categories.

Duration of Training

Another dimension is added to the description of training in industry when the duration variable is considered. As mentioned earlier in this chapter, much of the skill development activity reported by the Survey respondents was of a short-term nature. This observation is documented in Table 7-11, which shows the distribution of programs by length of training. From the results presented in this table, it is evident that much of the total effort involved training that was too brief to have been intended for the development of comprehensive packages of skills. Rather, specific-task transmission was likely the primary objective in many cases.

Table 7-11

Duration of Training Programs, 1979

	Proportion of all programs
	(Per cent)
Duration of training (weeks):	
1 or less	23.1
2-4	14.6
5-13	17.6
14-26	14.3
27-52	9.2
53-104	4.9
More than 104	16.3
All programs[1]	100.0 (n = 2,078)

n - number of programs.
1 Length of training was unavailable for 494 programs.
SOURCE HRS, 1979.

Of all of the programs reported, 23.1 per cent lasted one week or less. Furthermore, an additional 14.6 per cent ran from two to four weeks. Thus, close to two-fifths of the training cited was comprised of programs of no more than one month's duration. On the other hand, programs lasting one year or more represented only one-fifth of the total effort. Many of these longer undertakings fall into the category of apprenticeships and will be discussed later in the chapter.

In Table 7-12, the duration of programs is shown for each of the most often trained occupational groups. Most of these are characterized by very short training periods. For example, the majority of programs for both managerial and service personnel lasted one week or less, while the corresponding figure for the sales, sciences and engineering, and clerical categories exceeded 40 per cent. In the case of each of these groups, and processing as well, fewer than one-third of the programs reported had lasted six months or more.

Table 7-12
Duration of Training Programs, by Major Occupational Group, 1979

	Number of programs	Proportion of programs, by duration (weeks)				
		4 or less	5-26	27-52	More than 52	All programs
		(Per cent)				
Product fabricating and repair	419	24.8	24.3	7.9	43.0	100.0
Clerical	323	40.2	47.7	8.1	4.0	100.0
Sales	232	48.7	30.2	10.3	10.8	100.0
Managerial	225	59.6	22.7	9.3	8.4	100.0
Machining	197	14.2	29.4	11.2	45.2	100.0
Sciences and engineering	116	41.4	31.9	12.9	13.8	100.0
Service	111	55.9	35.1	5.4	3.6	100.0
Processing	107	36.4	43.0	7.5	13.1	100.0
Construction trades	88	9.1	19.3	9.1	62.5	100.0
All occupations	2,078	37.7	31.9	9.2	21.2	100.0

SOURCE HRS, 1979.

Protracted training periods tended to be reported only for personnel in product fabricating and repair, machining, and the construction trades. Not surprisingly, virtually all of the apprenticeship activity was located within these three groups. Table 7-12 indicates that construction trades training, in particular, was of a long-term nature; 62.5 per cent of these programs lasted more than one year.

Method of Training

The training activity reported by the Survey respondents was fairly evenly split among programs that provided classroom instruction only,[12] those that were carried out solely on-the-job, and those that were a combination of these two types (Table 7-13). There was some variation in the preferred methods among different sub-samples. For example, large firms were much more likely to carry out classroom-based training than small firms. On the other hand, on-the-job programs tended to be favoured by the smaller respondents. To some extent, methods also seem to vary by sector. While classroom instruction was the dominant form of training in finance, insurance, and real estate, and in services, on-the-job development was the most prevalent method in transportation, communication, and utilities. In mining, the majority of the programs undertaken combined classroom and on-the-job training.

Table 7-13
Method of Training, 1979

	Proportion of all programs
	(Per cent)
Method of training:	
Classroom only	32.1
On-the-job only	31.4
Mixed	36.5
All programs[1]	100.0
	(*n* = 2,510)

n - number of programs.
1 Method of training was unavailable for 62 programs.
SOURCE HRS, 1979.

Table 7-14
Method of Training, by Duration of Program, 1979

	Number of programs	Proportion of programs, by method of training			
		Classroom only	On-the-job only	Mixed	All programs
		(Per cent)			
Duration of program (weeks):					
4 or less	765	62.1	18.7	19.2	100.0
5-26	649	20.8	53.3	25.9	100.0
27-52	188	21.3	37.2	41.5	100.0
More than 52	436	7.8	7.3	84.9	100.0

SOURCE HRS, 1979.

Table 7-15

Method of Training, by Major Occupational Group, 1979

	Number of programs	Proportion of programs, by method of training			
		Classroom only	On-the-job only	Mixed	All programs
		(Per cent)			
Product fabricating and repair	484	22.3	23.8	53.9	100.0
Clerical	408	34.3	43.6	22.1	100.0
Sales	284	42.2	22.9	34.9	100.0
Managerial	270	66.7	12.6	20.7	100.0
Machining	225	8.9	36.0	55.1	100.0
Sciences and engineering	145	38.6	22.8	38.6	100.0
Service	134	21.6	57.5	20.9	100.0
Processing	130	26.2	46.9	26.9	100.0
Construction trades	108	5.6	32.4	62.0	100.0
All occupations	2,510	32.1	31.4	36.5	100.0

SOURCE HRS, 1979.

As Table 7-14 indicates, there also appears to be some link between the method used and the duration of the program. Most very short-term efforts were carried out in the classroom. As the length of training increased, however, this method became less important. The opposite relationship characterized the utilization of mixed approaches; in fact, virtually 85 per cent of the programs lasting one year or more fit into this category. A third pattern typified the use of on-the-job training, which was most often reported for programs of an intermediate length.

Different vocational skills seem to lend themselves to one or another of these training methods (Table 7-15). For example, sales and particularly managerial training was concentrated in the classroom, while programs for service, processing, and clerical personnel most often took place on the job. Finally, the majority of programs involving the construction trades, machining, and product fabricating and repair categories utilized the mixed approach.

Apprenticeship Training

The HRS inquired specifically about apprenticeship training which represents a significant portion of the long-duration, mixed-method programs referred to above. Although apprenticeships are the primary means of acquiring many high-level skills in most European countries, it has often been noted that this method is not well developed in Canada.[13]

Indeed, this observation is supported by the HRS inquiry, which covered both registered and non-registered apprentice programs.[14] Table 7-16 shows that only 15.7 per cent of the establishments surveyed had any apprentices in the previous 12 months. The highest incidence of courses was in the West, while very few were carried out in Quebec. Virtually all of the programs cited were in the construction, manufacturing, mining, and trade sectors. Also, large establishments were much more likely to have undertaken some apprenticeship activity than small ones. While only 6.3 per cent of the respondents with fewer than 20 employees reported an apprenticeship program, the corresponding figure for firms with over 500 workers was 42.5 per cent.

Table 7-16

The Incidence of Apprenticeship Programs, by Region, 1979

	Proportion of establishments with programs
	(Per cent)
Atlantic region	17.8
Quebec	4.4
Ontario	17.3
The West	24.2
Canada	15.7 (n = 1,354)

n – number of establishments.
SOURCE HRS, 1979.

According to the HRS data, the occupational distribution of apprenticeship training is quite concentrated (Table 7-17). In terms of both the number of programs and the number of trainees, product fabricating and repair accounted for approximately half of the total apprenticeship effort. Within this major group, 87 per cent of the programs reported were for apprentice machinery mechanics, motor vehicle mechanics, and equipment electricians. After

product fabricating and repair, most of the remaining apprenticeships involved machining and construction trades occupations. Apprentice tool and die makers, machinists, and welders were most numerous within the machining category, while programs for pipefitters/plumbers and carpenters were particularly prominent among the construction trades. The other crafts and equipment operating group is a minor centre of apprenticeship activity. All of the programs cited in this residual class of occupations involved the printing trades and stationary engineering.

Table 7-17

The Distribution of Apprenticeship Programs and Apprentices, by Major Occupational Group, 1979

	Proportion of programs	Proportion of apprentices
	(Per cent)	
Product fabricating and repair	51.7	49.5
Machining	21.3	14.8
Construction trades	16.0	25.6
Other crafts and equipment operating	5.2	4.0
Processing	2.5	3.2
Other	3.3	2.9
All occupations	100.0 (n = 362)	100.0 (n = 1,664)

n – number of programs or apprentices.
SOURCE HRS, 1979.

Costs of Training

Certainly, knowledge about the costs of training would seem to be important for both industry and government in establishing programs. Nevertheless, this is a subject on which virtually no information is available, at least within the public domain. Even more obscure are data pertaining to the eventual returns to establishments that make investments in training.

Indeed, some of the responses to the Human Resources Survey suggest that there are firms that go to great lengths to analyse their expenditures on vocational skills development. On the other hand it is clear that many establishments do not. Respondents were asked to report the costs to the company of their training activity; for only 34.1 per cent of the programs, was there a figure reported. Moreover, it can be assumed that, in many of these cases, only a very rough estimate was provided.

Having mentioned these problems, let us examine some of the HRS findings in this area. First, the average cost of the programs reported was $2,551 per trainee. Obviously, this figure can vary a great deal, depending on the nature of the activity carried out. For example, the type of skill being developed can make a significant difference in the amount spent by the firm. Table 7-18, shows that the average cost of programs for blue-collar skills (product fabricating and repair, machining, processing, and construction trades) was much higher than for white-collar skills (clerical, sales, managerial, sciences and engineering, and service).

Table 7-18

Average Training Program Costs, by Major Occupational Group, 1979

	Number of programs	Average cost to establishments per trainee
		(Dollars)
Product fabricating and repair	147	3,884
Clerical	159	1,222
Sales	122	2,349
Managerial	132	1,567
Machining	43	5,365
Sciences and engineering	69	3,005
Service	38	839
Processing	45	4,733
Construction trades	16	4,287
All occupations[1]	876	2,551

1 Costs were not reported for 1,696 programs.
SOURCE HRS, 1979.

Certainly, much of this variation is associated with occupational differences in the *types* of training provided. Earlier in this chapter, it was mentioned that, compared with the white-collar categories, the blue-collar groups were characterized by long-duration and mixed-method training. And, as Tables 7-19 and 7-20 indicate, these kinds of programs tend to be the most costly.[15] Specifically with respect to Table 7-20, it is interesting to note that the majority of costs reported were for classroom-only programs. Since this method constituted only one-third of the total training effort (Table 7-13), this over-representation of what is the most inexpensive type of program would seem to have caused an overall downward bias in the cost averages calculated from the HRS data.

Table 7-19

Average Training Costs, by Duration of Program, 1979

	Number of programs	Average cost to establishments per trainee
Duration of program (weeks):		(Dollars)
4 or less	386	893
5-26	244	2,763
27-52	72	4,444
More than 52	77	9,394

SOURCE HRS, 1979.

Table 7-20

Average Training Costs, by Method of Training, 1979

	Number of programs	Average cost to establishments per trainee
		(Dollars)
Method of training:		
Classroom only	474	791
On-the-job only	161	3,635
Mixed	226	5,234

SOURCE HRS, 1979.

While figures such as those presented in Tables 7-18, 7-19, and 7-20 shed some light on training expenditures, they ignore the very significant problem that stems from a lack of standardization in terms of the factors considered in the cost estimation. There are a variety of possible accounting procedures that an establishment might use; and, naturally, the cost reported can be very much a product of the particular approach employed.

In order to address this issue, the Survey respondents were asked to identify the items that they included in estimating training expenditures. These responses were then divided into three classes of cost factors: wages and salaries (trainees and instructors); production costs (machinery, power, materials, and wastage); and administrative costs (tuition, travel, and bookkeeping). On the basis of these classes, there are seven possible estimation procedures, and the extent to which each of these was utilized by the HRS respondents is shown in Table 7-21.

Table 7-21

The Utilization of Training Cost Estimation Procedures, 1979

	Proportion of all programs
	(Per cent)
Estimation procedure:	
Wages and salaries only	20.0
Production costs only	0.8
Administrative costs only	24.1
Wages and salaries and production costs	6.1
Wages and salaries and administrative costs	35.9
Production and administrative costs	1.4
Wages and salaries, production, and administrative costs	11.7
All procedures[1]	100.0 (n = 1,487)

n - number of programs.
1 No cost factors were cited for 1,085 programs.
SOURCE HRS, 1979.

As noted, the factors included in identifying training costs can have a significant effect on the actual figure reported for a particular program. Certainly, this is supported by the HRS data. When the most encompassing estimation procedure (i.e. wages and salaries, production, and administrative costs) was used,

Table 7-22

Training Costs for Selected Programs, 1979

	Program description				Cost to establishment per trainee		
	Method of training	Duration	Estimation procedure	Number of programs	Minimum	Maximum	Average
Major occupational group		(Weeks)				(Dollars)	
Product fabricating and repair	Mixed	More than 52	Wages, administration	14	1,000	50,000	15,706
Product fabricating and repair	Classroom	4 or less	Wages, administration	30	54	9,000	756
Clerical	On-the-job	5 - 26	Wages	10	100	2,430	1,156
Clerical	Classroom	4 or less	Administration	10	10	1,000	411
Sales	Classroom	4 or less	Wages, administration	18	70	4,250	1,067
Sales	Classroom	4 or less	Wages	12	8	1,920	284
Managerial	Classroom	4 or less	Wages, administration	27	38	5,000	1,322
Managerial	Classroom	4 or less	Administration	20	50	3,000	814

SOURCE HRS.1979.

the average company cost per trainee was $6,801, or 2.7 times the overall figure. On the other hand, when the simplest approaches (i.e. wages and salaries or production or administrative costs) were employed, the average cost was consistently below the total mean. While these findings, no doubt, reflect more than just the accounting procedures, they do demonstrate the significance of the lack of standardization in costing methods.

Clearly, then, there are many problems in collecting and interpreting establishment-level expenditure information. In light of these difficulties, perhaps a helpful approach for looking at this question of training costs is to consider separately packages of programs that are similar in terms of skill, method, duration, and accounting procedure. In this way, the expenses associated with a particular type of training effort can be more clearly evaluated. Although the use of the HRS data for this kind of investigation is limited because of the Survey design, some examples of this approach are shown in Table 7-22.

The first thing to notice from this table is the range of costs within a single program type. Despite the fact that all of the training classed with each type is similar in terms of skill, method, duration, and estimation procedure, the difference between the minimum and the maximum is consistently striking. To some extent, at least, this is probably the result of relatively crude cost estimates.

The two product fabricating and repair program types included give some idea of the different expense levels associated with long-term apprenticeship-style training and very short-term classroom courses. The examples drawn from the clerical occupational group illustrate the varying costs reported for training, differing in method, duration, and accounting approach. Finally, the program types selected from each of the sales and managerial groups are exactly alike except for the method in which the expenditures were estimated. The differences in the figures cited in the table underline the importance of taking this question of cost factors into account in analysing training costs.

Government Assistance

To conclude this description of skill development in industry, we shall discuss briefly the incidence of government assistance. According to the HRS data, most training instituted in the private sector goes on without any financial help from public sources. In fact, only 20.2 per cent of the programs cited by the Survey respondents benefited from government aid. Slightly over half of this subsidized training was carried out in manufacturing establishments, and the programs receiving assistance tended to be of a long-term, mixed-method nature.

Government aid was most often used for programs developing blue-collar skills. Nearly 40 per cent of the activity involving the machining group received assistance, while around to 33 per cent of the product fabricating and repair and the construction trades programs were at least partially funded by public monies (Table 7-23). In contrast, subsidization of training for white-collar skills was generally quite rare; for example, only about one-tenth of the clerical, sales, and managerial activity received assistance.

Table 7-23

Government Assistance in Training, by Major Occupational Group, 1979

	Number of programs	Proportion of programs with government assistance
		(Per cent)
Product fabricating and repair	380	33.2
Clerical	370	9.7
Sales	255	11.4
Managerial	241	9.5
Machining	168	39.3
Sciences and engineering	141	16.3
Service	111	23.4
Processing	115	27.0
Construction trades	72	30.6
Other	269	17.1
All occupations[1]	2,122	20.2

1 Information on government assistance was not available for 450 programs.

SOURCE HRS, 1979.

Summary

In this chapter, the vocational training activity of the HRS respondents was discussed. Essentially, the chapter had a dual focus: first, the extent of training carried out; and, second, a description of the programs cited. In comparison with earlier studies, the Survey found a relatively high incidence of training in industry. In fact, over 60 per cent of the participating establishments reported that they had instituted some skill development programs during the 12 months preceding the Survey. Closer examination, however, revealed that much of this effort involved short-term training, which was more likely to have been intended for the transmission of specific task competencies than for the provision of comprehensive skill packages. When only programs lasting one year or longer were considered, the incidence of training dropped to 20 per cent.

The level of training activity varied according to region, sector, and certain organizational characteristics. For example, establishments in the West carried out programs more often than respondents elsewhere in the country. Along the industry dimension, the highest rates were reported by operations in finance, insurance, and real estate, and in mining. In terms of long-term training, the construction, manufacturing, and mining sectors emerged as the leaders. Establishment size was positively correlated with carrying out training, while level of pay seemed to be linked only with the institution of long-term efforts.

Why is the incidence of skill development activity not higher? According to the non-training firms surveyed, the major deterrent was simply that there was no perceived need: just over half of the establishments said that vacancies could generally be filled by external recruiting. Certainly another factor to be considered is the apparent lack of human resource planning, which is so important for the effective implementation of training programs.

The description of training included the skills developed, the duration, methods, and costs of the programs; and the role of government. Close to one-fifth of the reported programs involved the product fabricating and repair group, while development of clerical, sales, and managerial skills was also significant. Although both machining and sciences and engineering were identified as high-shortage occupations, neither package of skills was widely transmitted in the participating establishments.

As noted, the training that was reported tended to be of a short-term nature. In fact, 38 per cent of all programs cited lasted four weeks or less. On the other hand, programs exceeding one year's duration represented only 20 per cent of the total training effort. In terms of instruction methods, the reported activity was fairly evenly split among classroom, on-the-job, and mixed methods.

The Survey inquired specifically about apprenticeship training; not unexpectedly, the results support the perception that this method of high-level skills transmission is not well developed in Canada. Only 16 per cent of the participating establishments had any apprentices in the previous 12 months. Most of the programs cited involved skills falling into the product fabricating and repair, machining, and construction trades categories.

The final sections of the chapter dealt with training costs. Little information is available regarding this issue, and in trying to bridge this information gap, one is faced with numerous problems. From the HRS experience, three very prominent difficulties are: a low rate of response, very rough estimates where figures are provided, and a lack of standardization in the accounting procedures employed by firms. This last problem was addressed by organizing the expenditure data by different estimation approaches. In this way, more comparable cost figures can be considered. To conclude the description of vocational skill development, the incidence of government assistance was briefly discussed. According to the HRS results, only one out of every five programs carried out in industry benefits from public subsidies.

Part 4

Conclusion

8 Skills in Canada

The purpose of this study has been to present the results of the Human Resources Survey in some detail. The Survey, itself, was motivated by shortcomings associated with labour market data in this country and, more particularly, the lack of establishment-level information. The specific interest of the HRS inquiry was twofold: first, to outline the dimensions of labour shortages; and, second, to address the strategies used by firms to meet skill requirements.

This concluding chapter will begin with a brief reiteration of the major findings in both of these areas. These results, considered in concert, seem to provide some interesting evidence to support a dualist characterization of the Canadian labour market. After exploring this observation, some policy implications will be drawn from the HRS analysis.

Survey Results

The responses of the 1,354 establishments surveyed suggest that shortages do indeed constitute a significant problem in this country. In fact, about one-half of the respondents experienced some difficulties in meeting skill requirements during the two-year period preceding the Survey. While reports of imbalances were certainly not limited to particular regions or sectors, firms in the West and in mining and manufacturing appeared the most affected.

The most critical shortages experienced from 1977 to 1979 involved certain high-level, blue-collar skills within the product fabricating and repair and the machining categories. Significant hiring difficulties were also cited for some jobs involving professional and technical personnel. Most prominent here were shortages involving the sciences and engineering group. For the most part, these hard-to-find skills were reported by respondents in all regions of the country.

What do establishments do in the face of shortage-related difficulties? In most cases, it appears that a number of strategies were used to try to solve a single problem. The measures most often relied upon included vocational training and, to a lesser extent, overtime and search outside the region. The latter response was particularly prominent among establishments in the West. The specific solution adopted varied significantly, according to the type of organization facing the problem. For example, large companies were able to search farther afield, pay more overtime, subcontract more frequently, and increase wages and benefits more often than their smaller counterparts. On the other hand, the less desirable responses, such as curtailing production and lowering job qualifications, were more commonly employed by small organizations.

Although adjustments were made, then, in the face of past imbalances, for the most part, similar shortages are anticipated in the future. Over 80 per cent of those respondents with hiring difficulties during 1977-79 expected problems in the 1980-84 period. Moreover, the occupations in short supply during the coming years are essentially those which previously posed the greatest problems. Thus, while immediate pressures may have been alleviated by past responses, the data suggest that the shortages have not been "solved." The obvious question, of course, is why not?

Information gathered from an establishment survey cannot alone answer this question. There are other parties involved, such as governments, education institutions, and workers, whose actions certainly play a part. Evidence from the HRS, however, does indicate that industry, in general, must improve its manpower planning and training performance. With respect to the former, nearly half of the respondents reported that they did not do any forecasting; of those that did, many addressed only some occupational groups and/or did not look very far down the road.

Regarding vocational training, the majority of the participating establishments did institute some programs in the year prior to the Survey. When the duration dimension was considered, however, the sample's efforts were not so impressive. Close to 40 per cent of all programs cited lasted four weeks or

less, and only about one-fifth of the respondents reported programs of at least one year's duration. Just 15 per cent of the total effort fell into the apprenticeship category. Thus, while many firms carry out some training, the Survey results suggest that the comprehensive development of badly needed high-level skills is not widespread within industry. Most of the long-term training that was cited was reported by large establishments, particularly within the construction, manufacturing, and mining sectors.

What kinds of training activities were instituted by the respondents? As we have already stressed, by far the greater part of the overall effort was short-term training. Much of this was carried out in classrooms and involved white-collar skills. The programs covering longer periods of time tended to follow on-the-job or mixed method formats and, for the most part, were concerned with blue-collar skills. Both in terms of programs and trainees, over half of all the reported training involved the product fabricating and repair, clerical, sales, and managerial groups.

Dual Labour Markets

When considered as a whole, the results of the HRS suggest that, for the Survey respondents, there appear to be two dominant types of labour market experiences. The first is characterized (at the establishment level) by hiring difficulties *along with* a seemingly well-developed human resources effort (i.e. training, forecasting, and extensive search patterns). The second, on the other hand, is just the opposite: no reported shortages *and* no manpower programs. The relevancy of this observed dichotomy to the dual labour market thesis is quite apparent, and since it could perhaps have some implications for future research and policy directions, this aspect of the HRS results merits some attention in this concluding chapter.

Evidence pointing to the polarity of human resource realities stems, for the most part, from a high degree of correlation among a set of critical labour market variables addressed by the HRS. To understand this, consider the following conclusions drawn from the Survey responses:

- The establishments that reported hiring difficulties also tended to be the ones carrying out vocational training. While 61.7 per cent of the entire HRS sample instituted some training, the propensity to train was significantly higher among respondents with shortages and much lower among those without them (Table 8-1). A similar pattern emerges when only long-term trainers (i.e. those reporting programs of at least one year's duration) are considered.

- The establishments that reported hiring difficulties and carried out vocational training tended, also, to forecast future labour requirements. On the other hand, the incidence of forecasting among those respondents without shortages or training was below that characterizing the overall HRS sample (Table 8-2).

- In comparison with other respondents, the establishments that reported hiring difficulties, training programs, and forecasting capabilities exhibited extensive employee search practices. In particular, these companies reported a significantly higher-than-average reliance on community colleges, vocational secondary schools, private training institutions, and extended recruiting (both in other regions of Canada and outside the country) in order to meet their needs for skilled labour.

Table 8-1

The Relationship between Hiring Difficulties and Vocational Training, 1977-79 and 1980-84

	Proportion of establishments that reported:	
	Some training	Training programs lasting at least one year
Establishments:		
With hiring difficulties, 1977-79		
Yes	82.2	33.6
No	41.6	10.7
Expecting hiring difficulties, 1980-84		
Yes	83.3	35.0
No	45.3	12.2
All establishments	61.7	20.3

SOURCE Human Resources Survey by the Economic Council of Canada, 1979.

Certainly, then, findings such as these would seem to indicate the existence of at least two vastly different types of labour market experiences. In order to determine whether certain kinds of organizations might be associated with one or the other of these experiences, two sub-samples of HRS respondents were created. The first, which will be referred to as Type A, consists of those establishments which reported hiring difficulties (both experienced and anticipated), instituted training, and carried out forecasting. The second (Type B) includes only those firms with the opposite responses: that is, those with no hiring difficulties, no training, and no forecasting. It

Table 8-2

The Relationship of Forecasting to Hiring Difficulties and Training, 1977-79 and 1980-84

	Proportion of establishments that reported forecasting
	(Per cent)
Establishments:	
With hiring difficulties, 1977-79	
Yes	65.9
No	51.0
Expecting hiring difficulties, 1980-84	
Yes	67.7
No	51.3
With training, 1979	
Yes	65.9
No	46.2
All establishments	58.3

SOURCE HRS, 1979.

is interesting to note that over 40 per cent of the HRS firms fit into one or the other of these two "archetypal" sub-samples (24.1 per cent in Type A and 16.2 per cent in Type B). The applicability of this typology, in itself, reinforces the conclusion of two labour market experiences.

There are obvious differences in the kinds of organizations fitting into the two sub-samples. First of all, the sectoral distribution of the Type A firms is virtually the obverse of that characterizing Type B establishments. Among the former, companies in mining and manufacturing are overrepresented, while those in transportation, communication, and utilities, in trade, and in construction are underrepresented. The Type B group, on the other hand, is weighted towards transportation, communication, and utilities and towards trade with relatively few firms in finance, insurance, and real estate, in manufacturing, and in mining.

In addition, there are differences between the two sub-samples with respect to a number of organizational characteristics. As Table 8-3 indicates, both in terms of employees and revenue, Type A firms tended to represent much larger operations than their Type B counterparts. Along these dimensions, the overall HRS sample fits in between these two subgroups. A similar pattern emerges when average weekly pay is considered. That is, compared with the Survey respondents as a whole, Type A companies had relatively high levels of compensation, while those reported by Type B establishments tended to be low. Another difference, although not shown in Table 8-3, is that Type A respondents were much more likely to belong to multi-establishment enterprises than Type B organizations.

Table 8-3

Selected Establishment Characteristics: HRS Sample and Type A and Type B Sub-Samples, 1979

	Establishment average		
	Type A sub-sample	Type B sub-sample	HRS sample
Number of employees (full-time)	196.8	41.6	132.6
Number of years in operation	25.1	25.2	26.2
Average weekly pay ($)	320.7	281.0	305.1
Gross revenue ($ million)	15.1	3.3	10.1
Collective bargaining coverage (per cent)			
Office employees	5.7	6.2	6.6
Non-office employees	34.2	32.2	33.1

SOURCE HRS, 1979.

The HRS data, then, point to a duality of labour market experiences based on a strong positive association at the establishment level between hiring difficulties and the development of human resource programs. What is the explanation for this apparently contradictory observation? Certainly, it cannot be that vocational training, forecasting, and extensive search patterns, in a perverse manner, impede the ability of a company to meet its personnel requirements. Perhaps, then, it is possible that some firms "buy" needed labour by hiring desired workers from the organizations that developed their skills. Granted, the widespread occurrence of this type of practice could result in a situation whereby establishments would tend to have both hiring difficulties and well-developed manpower programs, or neither. If this were indeed the primary explanation, though, one would logically expect that the "poaching" firms would offer higher wages and salaries than the "providing" companies. And yet this was not the case; in fact, the opposite was true.

Rather, the most probable explanation for the observed association between hiring difficulties and manpower programs lies with establishment labour demands. That is, some organizations have prominent skill requirements (in terms of numbers, levels, and so on), while others do not. By necessity, firms in the former category – those which correspond to our Type A sub-sample – are much more likely than those in the latter (i.e. Type B) to develop training, forecasting, and search practices. Type B establishments, without significant skill demands, can steer

clear of human resource development and, for the most part, still avoid staffing problems.

Even when manpower programs are instituted, as in the case of Type A firms, they are not always sufficient. Indeed, the widespread anticipation of continuing shortages indicates that often they are not. The reason for this may well be that the creation of organized efforts is generally *reactive* rather than *active*. Indeed, the strong correlation between hiring difficulties and manpower programs suggests that the presence of training and forecasting can be generally seen as a *response* on the part of many establishments to immediate shortage situations.

In a theoretical vein, these findings of the Human Resources Survey are of particular interest with respect to the dual labour market thesis.[1] The dual approach centres on the existence of two distinct labour markets. The first of these, the primary market, is characterized by employment with high wages, good working conditions, job stability, chances for promotion, and administrative work rules. In comparison, the secondary market offers poorer wages and working conditions, less stability, little possibility for advancement, and arbitrary management. Not surprisingly, there are parallel differences postulated with respect to the behaviour of workers in the two sectors.

A concept that is critical to the dual thesis is that of the internal labour market. Within these markets, the pricing and allocation of labour is not governed simply by economic variables but, rather, by established administrative rules and procedures. With the exception of ports-of-entry, requirements are generally met by the promotion or transfer of existing employees. Thus the planning and development of human resources assumes some importance within internal labour markets. In particular, forecasting and training play major roles.

Internal labour markets, in their structured form, are strongly associated with primary labour markets only. In light of this differentiation, they can be used as a helpful analytical tool for identifying and observing the two markets posited by the dual theorists. While, admittedly, the HRS did not gather all of the information necessary, the data do point to the existence of internal labour markets (or somewhat similar entities) in establishments that were labelled above as Type A. These organizations carry out training, forecasting, and other activities that are found in internal markets, although, as we have seen, the HRS findings suggest that these efforts are not always successful in fulfilling the human resources function. In contrast, the Type B firms exhibited few of the associated features. Given the established relationship between internal labour markets and market segmentation, the Type A and Type B subsamples could be seen as loosely representing primary and secondary markets, respectively.[2]

The results of the HRS, then, do support the essential notion of some form of segmentation in the Canadian labour market. Furthermore, this evidence is perhaps of particular interest since it has, as its basis, employer data collected at the establishment level. This contrasts with the usual empirical studies that approach dualism in one of two ways: either from the macro (industry) level or, ignoring the demand side altogether, from the supply (worker) perspective.[3] Many aspects of segmented market analysis, however, are closely tied to the workings of internal labour markets. And, since these are essentially micro-level phenomena, the importance of establishment data would seem to be apparent.[4]

While suggesting the existence of market segmentation, the Survey findings are not entirely consistent with "conventional" dual labour market theory. The points of departure that follow perhaps deserve close empirical attention in future research efforts.

1 The dual thesis assumes a significant difference in turnover behaviour between the two sectors. In contrast to the secondary market and its attendant instability, the primary market is typically characterized by low separation rates. This is, in fact, a cornerstone of sorts for the dual approach. More specifically, the theory goes, low turnover rates in the primary sector are a major compensation for the greater human resource costs (training, forecasting, higher wages, and so on) associated with that market. On the other hand, employers in the secondary sector are considered to accept high levels of turnover as an inevitable cost of their undeveloped employment arrangements. The HRS data, however, do not support these postulated relationships between stability and a specific market. In fact, the sub-sample that we have used as a proxy for the primary market (Type A) had, on average, somewhat higher establishment turnover rates than the secondary market sub-sample (Type B).[5] While the HRS collection of separation data was, admittedly, not rigorous, these results, nevertheless, pose some questions regarding the incidence and role of turnover in segmented markets.

2 It is generally posited that the organizational characteristics of firms populating the two markets differ in many ways. For example, the primary sector is assumed to include larger and more profitable firms than the latter sector. This was supported by the Survey results. In terms of unionization, however, the HRS findings are not consistent with the dual thesis that embodies a strong association between unionized jobs and the primary market. Rather, the Type A

and Type B sub-samples had very similar establishment unionization rates.[6]

3 Perhaps the major question raised by the HRS with respect to dual labour markets concerns the part played by establishment skill requirements. In fact, as argued earlier, labour demands appear to be critical in dictating the human resource postures adopted by the HRS respondents. That is, the development of what we have considered a structured internal labour market seems to have been largely an establishment response to its skill needs. Indeed, this forms the core of the typology that has been used in this chapter to approximate a dual labour market. Yet, company labour demands have not, in any way, constituted a focus in most previous segmentation approaches. In fact, it has been suggested that this does not really come into the dualist picture and that much employment could be organized along either the primary or secondary market model.[7] While the HRS data cannot categorically refute this assertion, they do cast some doubt on it. Certainly, the Survey results do suggest that skill demands may well play a central role in the firm-level organization of the human resources function and, hence, the segmentation of labour markets.

The HRS and the Canadian Labour Market

Meeting skill requirements has provided the focus for this report and, indeed, the Human Resources Survey itself. In this final section, some of the recommendations relevant to this issue that have emerged from the HRS data will be presented. As we shall see, the first point discussed below has a strong research orientation, while the others are more immediately concerned with industrial policy directions aimed at improving the matching of people and jobs in this country.

Establishment-Level Analysis

Following the discussion in the preceding section, *is evident that further work is necessary in understanding the labour mechanisms that operate at the micro level.* Certainly, issues related to meeting skill requirements cannot be completely addressed without this type of analysis. Firms play an important role in the allocation of labour and, as a consequence, "the manner in which individual employers take employment decisions would appear to be fairly critical to any explanation of the labour market . . .."[8] The HRS data, themselves, underline the specific need for understanding the conditions that dictate the presence, or absence, of internal labour markets. More specifically, our results suggest that the relationship between establishment skill requirements and employment practices merits the close attention of future research.

Labour Market Data

The identification of imbalances and the institution of effective programs would logically seem to rest on accurate labour market information.[9] *Unfortunately, at the present time, the availability of such data is generally limited.* Two specific issues addressed by this Survey – shortages and training – provide cases in point. With existing data collection efforts, imbalances cannot be easily detected, since we have little idea of the dimensions of occupational demand and virtually none of supply. It is not surprising, then, that the shortages documented by the HRS were not identified until they were upon us. Similarly, the collection of data on vocational training in industry is unfortunate in its inadequacy. Particularly glaring is the near total absence of information on activity instituted without any public assistance. Yet it would seem reasonable for the very significant government expenditures in the area of training to be made with a knowledge of the existing effort carried out by industry.

Mobility

The HRS results suggest that the hard-to-find skills are, for the most part, in demand in all parts of the country. As a consequence, interregional mobility (bringing those qualified to the jobs) cannot be considered an effective general solution to our shortage-related difficulties. Moreover, many of the skills that pose major problems in Canada seem, in fact, to be in demand throughout the industrialized world.[10] Accordingly, it must be recognized that the remedial value of immigration is limited.

Developing Vocational Skills in Industry

If mobility is not the solution for Canada's shortages, then we must look to an improvement in our ability to domestically develop needed skills. By definition, training and education cannot immediately alleviate the current problems; as a consequence, the general recommendations that follow are presented as priorities for future policy directions.

The results of the HRS do indicate that vocational training is instituted in industry. Much of this effort, though, is clearly not responsive to the most critical labour market demands. Accordingly, government activity should be tailored to fill the apparent voids. In other words, programs must focus on that training which is needed for labour market balancing but is unlikely to be carried out by industry on its own.

Following this principle, an obvious priority for government involvement concerns the development of skills for technical and trades occupations. It is clear from the HRS and other sources that, in general, the supply of people qualified in these areas is inadequate. In considering these shortages, it should be noted that the required training is both protracted and costly. Financial assistance, then, may well be necessary to stimulate skill development efforts in these areas.

In fact, in pursuing labour market efficiency, public policy, in general, should focus more on long-duration training, even at the expense of decreasing support for short-term efforts. The HRS data indicate that businesses are reluctant to carry out the former type of program without subsidization; on the other hand, assistance does not seem critical for activities falling into the latter category. Small firms, in particular, are unlikely, by themselves, to institute long-term training and, as a result, any inducement programs should be designed to be attractive to these enterprises.

Public policies should recognize the distinction between general and enterprise-specific training and should strongly emphasize the former type of activity. Admittedly, when shortages exist, it is attractive to implement programs that encourage the speedy transmission of the specific vocational skills needed to fill existing vacancies. Policy makers should adopt a longer-term perspective, however, and favour adjustment strategies that are targeted towards the development of more comprehensive skill packages. In the first place, in light of the rapidly changing labour market, the specific skills needed most urgently at the present time may well be different from those in greatest demand a few years from now. Accordingly, policies that focus on the narrow development of particular abilities may have only short-term value in alleviating shortages. The transmission of more complete skills, though, will have long-run benefits, as the labour force will be able to adapt to changing demands. Another reason for public policy emphasis on general training stems from the fact that since enterprise-specific training is relatively inexpensive and tends to be closely linked to production, it is likely to occur within firms whether subsidies are provided or not. General training, on the other hand, is costly, and, from the establishment's point of view, it may involve excessive instruction. As a result (and this is suggested by the HRS data), some form of inducement may be necessary if industry participation in the development of comprehensive skills is viewed as desirable.

Finally, in advocating a policy that stresses general competency in a vocational area, one must recognize the important collaborative role that the education system must play. The transmission of many occupational skills is best suited to a school setting, while a mixed format of school and on-the-job training is most appropriate for others. By utilizing the resources of the education system to complement those in industry, a creative and adaptive work force can be developed to meet the future demands of the Canadian labour market.

A The Survey Questionnaire and Covering Letters

This appendix includes copies of the Survey questionnaire and the covering letters included in the original mailing (October 1979) and the follow-up (December 1979). The material was addressed to the "Director of Personnel" in each establishment.

October 1979

Dear Sir/Madam:

Amidst our high level of unemployment, more and more businesses across Canada are voicing a concern that they cannot get enough people in certain skill categories. These shortages, of course, are hindering the effective operation of the Canadian economy. Unfortunately, it is generally expected that this situation will worsen in the 1980s unless corrective action is taken.

In order to respond to these problems, more has to be known about the experiences of companies in Canada in meeting their skill requirements. In light of this, the Economic Council of Canada is asking a selection of industrial establishments across the country to identify skill shortages facing them and to describe their programs for overcoming these problems. With an improved knowledge of industry's views of what is happening, we can then better recommend to the federal government ways in which these shortages can be solved. The Council of Canadian Personnel Associations concurs that skill shortages pose a very significant problem and it recognizes the importance of the Economic Council's effort to become acquainted with the relevant experiences of Canadian companies.

Our success depends, of course, upon the degree to which we can obtain pertinent information. This being the case, I would ask for your establishment's co-operation in filling out the attached questionnaire and returning it to us by November 23, 1979. On the basis of reactions from the companies participating in the pre-test of this questionnaire, this exercise might also present an opportunity for you to view your own manpower picture.

You can be assured that the information which you provide will be held in the strictest confidence and, naturally, any publications will safeguard the identity of individual establishments. If you would like to receive a copy of the survey report, please note this at the end of the questionnaire.

If this questionnaire has not arrived at the appropriate location, could you please pass it on. Should you have any questions, do not hesitate to contact the Human Resources Survey at (613) 993-3163.

May I thank you in advance for your co-operation.

Yours sincerely,

Sylvia Ostry
Chairman

December 1979

Dear Sir/Madam:

In October, in response to a growing concern about skill shortages, the Economic Council of Canada asked a selection of business establishments, including yours, to identify skill shortages facing them and to describe their responses to these problems.

In the letter which was sent to you at that time, I wrote that more had to be known about the human resource experiences of companies in Canada if the Economic Council was to recommend to the federal government effective ways in which these shortages could be solved. It is also critical that we become acquainted with the experiences of as many different types of establishments as possible for only in this way can we take into account the diversity of needs facing employers across the country.

This being the case, I would ask, once again, for your establishment's co-operating in filling out the attached questionnaire. Whatever your human resource experiences are, this would certainly contribute to our understanding of what policies are needed.

Naturally, all information which you provide will be held in the strictest confidence. If you would like to receive a copy of the survey report, please note this at the end of the questionnaire.

Should you have questions regarding the survey or any difficulties in filling out the form, do not hesitate to contact the Human Resources Survey at (613) 993-3163. It would be appreciated if the completed questionnaire could be returned to us by January 11, 1980.

I am looking forward to your response.

Yours sincerely,

Sylvia Ostry,
Chairman

HUMAN RESOURCES SURVEY

Establishment Name: _____

Address: _____

_____

_____

Name of Respondent: _____ Telephone No. _____

PART A: SKILL SHORTAGES

1. (a) In the past two years, has your establishment had any difficulty in hiring personnel due to a shortage of qualified people? Yes ☐ No ☐

If no, please go on to Question 2.

(b) For each time you have experienced a shortage of qualified personnel in the past two years, please enter the following information in the table below.

JOB TITLE (and brief description if necessary)	YEAR(S) OF SHORTAGE	NUMBER OF EMPLOYEES REQUIRED	COMPANY'S SOLUTION (check one or more)										
			curtailed production	sub-contracted	trained personnel	improved wages, benefits	searched outside region	searched abroad	lowered qualifications	overtime	capital substitution	other (specify)
1.												
2.												
3.												
4.												
5.												
6.												
7.												

If you need additional space, please use the blank page at the end of the questionnaire.

2. (a) In the next five years, does your establishment anticipate any problems in hiring personnel due to a shortage of qualified people? Yes ☐ No ☐

If no, please go on to Question 3.

(b) For each anticipated shortage of qualified personnel in the next five years, please enter the following information in the table below.

JOB TITLE (and brief description if necessary)	YEAR(S) OF ANTICIPATED SHORTAGE	NUMBER OF EMPLOYEES REQUIRED
1.		
2.		
3.		
4.		
5.		
6.		
7.		

If you need additional space, please use the blank page at the end of the questionnaire.

PART B: MEETING SKILL REQUIREMENTS

This section focuses upon the training of employees working in your establishment. For our purposes, training can be considered as the worker's acquisition of vocational skills to directly improve future productivity. Accordingly, please do not include safety and orientation training in your responses below.

3. (a) During the past 12 months, have any employees in your establishment received any training instituted by the company? (*Please include training both inside and outside the company. Also include programs beginning before but extending into the past year.*)

Yes	No
☐	☐

If no, please go on to Question 4.

(b) This table refers to all training for establishment personnel which was occurring at any time during the past 12 months. Please include all vocational skill training for employees both on and off the premises including those cases where your company has provided only financial or other assistance.

TYPE OF TRAINING	IDENTIFICATION (specific job title)	METHOD (check one or more)				DURATION OF TRAINING PERIOD	NUMBER OF TRAINEES	GOVERNMENT ASSISTANCE		COST PER TRAINEE TO COMPANY (*if known*)
		Classroom (inside company)	Classroom (outside company)	On-the-job	Correspondence course			Yes	No	
1. Trade and manual skills (non-apprentice)	a.									
	b.									
	c.									
2. Office (secretarial, bookkeeping, keypunch operating, etc.)	a.									
	b.									
	c.									
3. Sales (exclude management training)	a.									
	b.									
	c.									
4. Professional, Technical	a.									
	b.									
	c.									
5. Managerial, supervisory	a.									
	b.									
	c.									

	TRADE	LENGTH OF APPRENTICE-SHIP (years)	NUMBER OF APPRENTICES							
			1st yr	2nd yr	3rd yr	4th or more	Total			
6. Apprenticeship (leading to journeyman status)	a.									
	b.									
	c.									

If you need additional space, please use the blank page at the end of the questionnaire.

(c) Which of the following factors have been included in the costs estimated in the above table?

(i) wages and salaries of trainees ☐
(ii) wages and salaries of instructors ☐
(iii) industrial costs (machinery, power, materials, other overhead) ☐
(iv) tuition, travel, accommodation ☐
(v) administration costs ☐
(vi) other costs (*please specify*)_____

4. Are there any ways in which the government training assistance programs might better suit your establishment's needs?

_____

_____

_____

_____

_____

_____

_____

5. The following are often cited as factors which deter companies from investing in skills training. Please indicate which of the following are important deterrents for your establishment. *(Check none, some, or all.)*

(i) Vacancies can generally be filled by hiring outside personnel who already have the required skills ☐
(ii) Workers often leave us during or after the training program ☐
(iii) Adequate financial resources do not exist to develop or implement programs ☐
(iv) In-company training affects production by tying up equipment, instructors, etc. ☐

(v) Other deterrents *(please specify)* _____

_____

6. Please indicate which of the following are important sources of skilled labour for your establishment. *(Check one or more.)*

(i) community colleges, CEGEPs ☐
(ii) vocational secondary school courses ☐
(iii) private training institutions ☐
(iv) unions, employee associations ☐
(v) the local labour market ☐
(vi) other parts of Canada ☐
(vii) outside Canada ☐
(viii) other sources *(please specify)* _____

_____

7. Please indicate how far into the future your requirements for the following types of personnel are formally forecasted?

	Number of Years
(i) Management	—
(ii) First-line supervisors	—
(iii) Professional and technical	—
(iv) Skilled workers	—
(v) Sales	—
(vi) Other office employees	—

PART C: BACKGROUND INFORMATION

8. How long has this establishment been in operation? _____

9. (a) Please estimate the number of full-time personnel currently employed by your establishment and their approximate average gross weekly pay for the following categories.

OCCUPATION CATEGORY	NUMBER OF EMPLOYEES	AVERAGE GROSS WEEKLY PAY
Management		
First-line supervisory		
Professional and technical		
Skilled workers (including apprentices)		
General manual		
Sales		
Other office employees		
All employees		

(b) What were the maximum and minimum levels of full-time employment in your establishment during the past 12 months and when did these occur?

(i) maximum _____ (month _____) (ii) minimum _____ (month _____)

(c) What was the turnover rate in your establishment during the past 12 months?

(i) for office employees ____ %

(ii) for non-office employees ____ %

10. (a) Please estimate the percentage of the full-time personnel in your establishment covered by collective bargaining.

(i) office employees ____ %

(ii) non-office employees ____ %

(b) Could you briefly describe the role played by the union(s) in your establishment's manpower program?

_____

_____

_____

_____

11. (a) What was the gross revenue during the past fiscal year for:

(i) your establishment _____ (ii) your company _____ (if a multi-establishment enterprise)

(b) Could you please name your parent company, if one exists?

_____

Thank you very much for your time and co-operation in answering these questions. If you need additional space or wish to make any comments, there is a blank sheet attached. Please return this questionnaire by November 23, 1979 to the Human Resources Survey, Economic Council of Canada, P.O. Box 527, Ottawa, Ontario K1P 9Z9. If you have any questions, do not hesitate to call us at (613) 993-3163.

B The HRS Wage/Salary Data

In looking at human resource issues at the establishment level, detailed data on wages and salaries obviously constitute an important priority. Given the sensitivity of many companies in this area, however, the HRS attempted to gather adequate compensation information without imposing a serious response burden. As can be seen from question 9 of the questionnaire (Appendix A), the approach used was to request average gross weekly pay for full-time workers in seven broad occupational categories. In addition, an all-employees figure was collected or calculated (if possible). Throughout this study, any reporting of Survey results on wages and salaries has exclusively used the composite figure.

In order to assess their reliability, the HRS compensation data were compared with those collected nationally by Statistics Canada in its Larger Firm Survey. It should be noted that there are some minor differences between these two surveys regarding coverage and classification. These are discussed in Chapter 2. As Tables B-1 and B-2 indicate, the HRS wage data are relatively comparable to the Larger Firm Survey figures. In terms of the overall average, in fact, the two surveys differ only slightly. When the samples are broken down geographically and by industry, the only major discrepancy involves the service sector.

Table B-1

Average Weekly Pay of Surveyed Establishments, by Region and Province, November 1979

	Average weekly pay per full-time employee	
	Human Resources Survey	Larger Firm Survey
	(Dollars)	
Atlantic region	262	259
Newfoundland	279	274
Prince Edward Island	263	213
Nova Scotia	248	251
New Brunswick	252	265
Quebec	290	291
Ontario	291	293
The West	350	316
Manitoba	312	265
Saskatchewan	315	284
Alberta	358	318
British Columbia	368	343
Canada	305	297

SOURCE Economic Council of Canada, Human Resources Survey; and Statistics Canada's Larger Firm Survey - *Employment, Earnings, and Hours*, Cat. 72-002, January 1980.

Table B-2

Average Weekly Pay of Surveyed Establishments, by Industry, November 1979

	Average weekly pay per full-time employee	
	Human Resources Survey	Larger Firm Survey
	(Dollars)	
Mining	444	443
Construction	400	431
Manufacturing	292	323
Transportation, communication, and utilities	331	349
Trade	278	222
Finance, insurance, and real estate	325	280
Service	295	198
All Industries	305	297

SOURCE Economic Council of Canada, Human Resources Survey; and Statistics Canada's Larger Firm Survey - *Employment, Earnings, and Hours*, Cat. 72-002, January 1980.

Notes

CHAPTER 1

1 In fact, this process of evaluation has already commenced. A number of groups from government, industry, and labour have looked at the current imbalances. Within the public sector, the most prominent groups are: the federal Department of Employment and Immigration's Labour Market Development Task Force; and the Special Parliamentary Committee on Employment Opportunities for the 80s.

2 Any reports and surveys that do exist tend to indicate shortages in specific occupations, industries, or regions. For a summary listing of much of this fragmentary evidence, see Norman Leckie, "Evidence of Skill Shortages in Canada," Economic Council of Canada (mimeograph), 1981.

3 The limited information that is available on vocational training in the private sector has primarily come from the following four studies: Dominion Bureau of Statistics, *Organized Training in Four Major Industries*, Cat. 81-525, Ottawa, 1965; Dominion Bureau of Statistics, *Organized Training in Four Industry Groups – 1965*, Cat. 81-539, Ottawa, 1967; Statistics Canada, *Training in Industry, 1969-70*, Cat. 81-555, Ottawa, 1973; and The Commission of Inquiry on Educational Leave and Productivity, *Education and Working Canadians*, Ottawa: Labour Canada, 1979).

4 The importance of labour market information and its role in policy making is discussed in Keith Newton, Gordon Betcherman, and Noah Meltz, "Diagnosing Labour Market Imbalances in Canada," *Canadian Public Policy* 7, no. 1 (Winter, 1981): 94-102.

5 An earlier publication highlights the survey's major findings. See Gordon Betcherman, *Skills and Shortages: A Summary Guide to the Findings of the Human Resources Survey*, Economic Council of Canada (Hull: Supply and Services, Canada, 1980).

CHAPTER 2

1 The development of the questionnaire was aided considerably by a consultative pre-test stage. In this phase, a diverse group of organizations responded to early versions of the Survey instrument and made suggestions as to how improvements might be made.

2 This distinction, of course, is only significant in cases of multi-location enterprises. During the pre-test consultations, it became evident that, for the most part, detailed and accurate data on experiences in the areas of shortages, training, and employee search are more available at the establishment level than at the company level. While the headquarters of an organization can provide an overview and statements on general policy, often it does not have the kind of "on the floor" information required for this Survey.

3 Basic establishment characteristics, such as industry and employment, accompanied each Dun and Bradstreet listing. This, of course, made the noted modifications possible. With respect to the size adjustment, however, the inventory's information was evidently not strictly accurate in some cases. For, despite the specified employment criterion, about 15 per cent of the eventual respondents reported pay rolls of less than 20 workers.

4 Actually, the original mailing list included 4,153 establishments. During the mail-back phase, however, it became apparent that not all of these could be considered potential survey respondents. Some establishments could not be located; others, it turned out, were no longer in active operation. In addition, a small number of selected companies were in agriculture, forestry, and fishing, and thus had to be excluded. Finally, a few recipients, being directly administered from corporate headquarters, could not provide information as organizational units and thus could not be legitimate respondents for an establishment survey.

5 Along this dimension, then, the two surveys under consideration here are similar. For details on the Larger Firm Survey and its coverage, see Statistics Canada, *Employment, Earnings and Hours*, Cat. 72-005, Ottawa. Information in the following tables on the Larger Firm Sample comes from unpublished Statistics Canada data.

CHAPTER 3

1 For a historical treatment of these shortages, see Canada Department of Labour, *Skilled and Professional Manpower in Canada, 1945-1965*, a study prepared for the Royal Commission on Canada's Economic Prospects (Ottawa: Queen's Printer, 1957). The early work of the Economic Council of Canada also dealt with the issue of shortages; for example, see their *First Annual Review: Economic Goals for Canada to 1970* (Ottawa: Queen's Printer, 1964), and

Louis Parai, *Immigration and Emigration of Professional and Skilled Manpower During the Post-War Period*, Economic Council of Canada (Ottawa: Queen's Printer, 1965).

2 Examples of the existence of shortages have come from a number of localized surveys. Sponsors of these efforts include governments at all levels, employers' associations, labour organizations, educational institutions, and industrial training committees. Details on these various efforts are provided in Norm Leckie, "Evidence of Skill Shortages in Canada," Economic Council of Canada (mimeograph), 1981.

3 The original HRS listing included the U.S. standard industrial classification (SIC) for each establishment. This code was retained and, accordingly, the organization of the sample by industry follows the American system. This classification, which is extremely similar to its Canadian counterpart, is detailed in the *Standard Industrial Classification Manual*, prepared by the Statistical Policy Division, Executive Office of the President, Office of Management and Budget, Washington, 1972.

4 Results of that project are presented in the *Preliminary Report on Human Resource Planning in the Canadian Mining Industry: Co-operative Approaches for the Eighties*, prepared by the Mining Association of Canada, November 1980.

5 For a more detailed discussion, see *A Report by the Sector Task Force on Mobility in the Construction Industry*, Ottawa, 1980.

6 In fact, the presence of shortages has probably been better documented within manufacturing than elsewhere in the economy. For two examples of the information collected in this sector, see the Machinery and Equipment Manufacturers' Association of Canada, *Results of a Survey of Skilled Tradesmen Requirement and Training in the Industrial Machinery and Equipment Manufacturing Sector from 1979 to 1982*, Ottawa, 1979; and the Ontario Manpower Commission, *Manpower Requirements and Hiring Plans of Ontario Employers in Manufacturing Industries*, Toronto, 1979.

7 For both the 1977-79 and 1980-84 periods, establishments were asked whether they experienced/anticipated hiring difficulties. If the answer was affirmative, the respondent was requested to give details on each shortage situation. Specifically with respect to the numbers of employees required, two problems were apparent. First, there was a high incidence of missing data; and, second, when numbers were provided, it was evident that there was a significant element of unreliability. It is very likely that this stems from the nature of the question, which required recall for the past period and projection for the future. Anyone familiar with surveys will recognize the difficulties associated with detailed statistical data gathered with a reliance on these techniques.

8 An earlier Economic Council of Canada analysis established some relationship between company age and personnel outcomes. More specifically, this study found that relatively new manufacturing firms experienced significantly higher quit rates than their older counterparts. See Norman Leckie, Gordon Betcherman, and Keith Newton, *An Analysis of Turnover in Ontario Industrial Establishments*, Economic Council of Canada (Ottawa: Supply and Services Canada, 1980).

9 For details on the collection and reliability of the wage and salary data, see Appendix B.

CHAPTER 4

1 Some of these gaps in the collection of labour market information are discussed in Keith Newton, Gordon Betcherman, and Noah Meltz, "Diagnosing Labour Market Imbalances in Canada," *Canadian Public Policy*, 7, no. 1 (Winter 1981): 94-102.

2 This system is concisely set out in Dominion Bureau of Statistics, *Occupational Classification Manual*, Vol. I, Cat. 12-536 (Ottawa: Information Canada, 1971).

3 See footnote 7, Chapter 3. The problem of missing information was handled by computing an *average* number of employees required per hiring difficulty for each unit occupational group (4-digit CCDO). When numbers were not provided, then, this mean figure was substituted. The effectiveness of such a strategy, of course, is positively related to the number of cases where information was reported.

4 It should be noted that the positions included in these estimated statistics have not necessarily remained vacant. Rather, their defining characteristic is that they have been, or are anticipated to be, difficult to fill because of a shortage of qualified people. There are a number of ways in which an establishment can adjust to such a situation, and these are discussed in Chapter 5.

5 These specific jobs within the unit groupings correspond to the 7-digit level of the CCDO system. Because of coding limitations, however, the HRS data have not been organized beyond the 4-digit groups. For the completely disaggregated classification, consult Canada Department of Manpower and Immigration, *Canadian Classification and Dictionary of Occupations*, Vol. 1 (Ottawa: Information Canada, 1971).

CHAPTER 5

1 The lack of knowledge in this area has been lessened by Barry Thomas and David Denton, *Labour Shortage and Economic Analysis: A Study of Occupational Labour Markets* (Oxford: Blackwell, 1977). It should be mentioned that their analysis has made an important contribution to various aspects of the discussion in this chapter.

2 In particular, the internal labour market literature focuses upon the importance of the establishment in terms of decisions that affect the adjustment process. For an example of this view, see Peter Doeringer and Michael Piore, *Internal Labor Markets and Manpower Analysis* (Lexington, Mass: D. C. Heath, 1971).

3 Admittedly, there are factors that might dictate adjustment decisions for which we have no information. For example, Thomas and Denton, in *Labour Shortage*, found that internal political factors, the decision-making structure, and plant-level history all exerted some influence on the responses taken by the establishment. Unfortunately, none of these were addressed by the Survey questionnaire.

4 Thomas and Denton, *Labour Shortage*, Chapter 2.

5 Constraints on the employer's behaviour can come from many sources. For example, government legislation may, in one way or another, affect a number of adjustment mechanisms, including training, search, and overtime. Similarly, where collective agreements exist, responses, of course, must follow accepted practices. Preferences of workers and managers, too, can exert some influence on the adjustment decisions made by an employer.

6 A detailed inventory of possible adjustments to shortages is presented by Thomas and Denton in *Labour Shortage*, Appendix A.

7 For the approach used by the HRS to address the adjustment issue, see question 1(b) on the Survey questionnaire (Appendix A of this report).

8 Certainly, one of the reasons for this lies in the interdependencies among many of the adjustment instruments. That is, the use of one mechanism may necessarily entail the implementation of another. For example, lowering the desired qualification would often be accompanied by the need to carry out some vocational training.

9 There is, in fact, a positive correlation between hiring difficulties of long duration and those embracing a number of vacancies. To a certain extent, a shortage that has an extended effect (in terms of positions) is likely to require an adjustment of some complexity; hence, it will tend to endure longer than a single-vacancy problem.

10 Two points should be noted concerning the concept of adjustment variations according to the number of affected positions. First, as mentioned in earlier chapters, the raw nature of the vacancy data should be recognized. Second, the notion of classifying imbalance situations by the number of associated vacancies implies that the resolution of the problems comes about only by "filling the opening." This, of course, is somewhat of an oversimplification; as noted throughout this chapter, a wide range of adjustment measures are used to address imbalances in a variety of ways.

11 Other organizational variables, such as establishment age and union status, were considered. These characteristics, however, did not appear to have any significant bearing on adjustment patterns.

CHAPTER 6

1 This latter issue is considered in some detail in Chapter 5.

2 It should be mentioned that along some of the dimensions that we considered, no significant differences in sources of skilled labour were apparent. Examples of this were establishment age and the size of the community in which the organization was located. For the most part, the level of unionization, too, made little difference, with the logical exception that unionized firms were much more likely to rely on unions as a skill source than non-unionized organizations.

CHAPTER 7

1 There is some regular dissemination of data pertaining to federally funded training through Employment and Immigration Canada, *Annual Statistical Bulletin, Canada Manpower Training Program*. Also, Statistics Canada released information annually in *Publicly-Supported Vocational Training Involving the Private Sector*, Cat. 81-238. Unfortunately, this series terminated with the 1977-78 edition.

2 The findings of these investigations are reported in Dominion Bureau of Statistics, *Organized Training in Four Major Industries*, Cat. 81-525, Ottawa, 1965; Dominion Bureau of Statistics, *Organized Training in Four Industry Groups – 1965*, Cat. 81-539, Ottawa, 1967; Statistics Canada, *Training in Industry, 1969-70*, Cat. 81-555, Ottawa, 1973; and the Commission of Inquiry on Educational Leave and Productivity, *Education and Working Canadians*, Labour Canada, Ottawa, 1979.

3 A clear presentation of some of the major findings from both of these surveys can be found in Roy J. Adams, "Training in Canadian Industry: Research, Theory and Policy Implications," *Current and Future Perspectives in Canadian Industrial Relations*, Proceedings of the 17th Annual Meeting of the Canadian Industrial Relations Association, Montreal, June 1980.

4 As one might expect, there may be various interpretations of what is considered training; and, naturally, this can affect the results. The Statistics Canada inquiry was concerned with formal vocational training programs offered by the employer. On-the-job programs, classroom instruction, apprenticeships, and the provision of financial or other assistance were all accepted. The Commission considered training to include paid time during working hours, where the employee is receiving in-house training, safety training, development, and instruction rather than carrying out normal duties. Apprenticeship plans were not covered.

5 For the wording of our Survey's question on training activity, see question 3 on the questionnaire (Appendix A). Activity both on and off the premises was included, as were cases where only financial (or other) assistance was provided.

6 Unless otherwise mentioned, the results on training include both apprenticeship and non-apprenticeship activity.

7 For another recent treatment of this issue within the Canadian context, see Edward B. Harvey, *Barriers to Employer-Sponsored Training in Ontario*, Ontario Ministry of Colleges and Universities, Toronto, 1980. In

this study, Harvey reports the results of a survey focusing on the training experiences of 49 firms. Interestingly, he observed that "with respect to a number of potential barriers or deterrents to the provision of training programs, the barrier or deterrent effect of these factors assumes a greater salience in non-training firms than in training firms" [p. 21].

8 The findings in this area are limited, in a sense, to the way in which the particular deterrents have been specified in the questionnaire. That is, if there are other important barriers, these are not likely to emerge. While an "other deterrents" option was included, like most residual categories, it was cited by only a small number of respondents.

9 Forecasting within industry is yet another human resources area about which we have little empirical evidence in this country. Two early endeavours were B. A. Keys and H. H. Wright, *Manpower Planning in Industry: A Case Study*, Economic Council of Canada (Ottawa: Queen's Printer, 1966); and B. A. Keys, F. G. Thompson, and M. Heath, *Meeting Managerial Manpower Needs*, Economic Council of Canada (Ottawa: Information Canada, 1971).

10 Establishments were asked whether or not they formally forecasted requirements in each of six broad occupational groups. If planning was reported for any of the six, the respondent was considered a "forecasting" firm. Accordingly, the figures reported here likely overestimate the level of forecasting activity. For the HRS approach, see question 7 of the questionnaire (Appendix A).

11 In cases where the number of trainees in a program was not provided, an estimate was used. The figure substituted represented the *average* number of employees reported for programs involving the appropriate unit occupational group (4-digit CCDO).

12 This method includes classroom instruction, both on and off the premises, and also correspondence courses.

13 Particularly in comparison with countries such as Austria, Germany, and Switzerland, Canada has a very low incidence of apprentices. See the Organization for Economic Co-Operation and Development, *Policies for Apprenticeship*, (Paris: OECD, 1979).

14 Depending upon the trade and the jurisdiction, apprentices may or may not be registered by regulation with the appropriate Department of Labour. In both cases, however, the trainee has entered into a contract with an employer to learn a skilled trade through classroom and on-the-job development. It has been estimated that the number of registered and non-registered apprenticeships are about the same. More information is available in Statistics Canada, *Publicly-Supported Vocational Training*.

15 Some of this long-duration, mixed-method training was of an apprenticeship nature. On average, the cost of an apprenticeship program was four times greater than the cost of a general program.

CHAPTER 8

1 The dual labour market theory owes its genesis to a series of American studies that addressed the problems of the urban working poor. For the seminal elaboration of this approach, see Peter B. Doeringer and Michael J. Piore, *Internal Labor Markets and Manpower Analysis* (Lexington, Mass.: Heath Lexington, 1971). A general treatment in terms of the Canadian context is provided by David C. Smith, *The Dual Labour Market Theory: A Canadian Perspective*, Industrial Relations Centre, Queen's University, Research and Current Issues Series No. 32, Kingston, 1976.

2 According to the dual thesis, groups of establishments, strictly speaking, cannot simply be placed in either the primary or secondary market. In fact, it is asserted that both types of market conditions can theoretically exist within a single organization. For the purposes of this discussion, though, this and other departures will be accepted in order to operationalize our Type-A/Type-B representation.

3 A recent Canadian example of the macro demand approach was carried out by Chan F. Aw, *A Dual Labour Market Analysis: A Study of Canadian Manufacturing Industries*, Labour Canada Discussion Paper (Ottawa: Supply and Services Canada, 1981). This study, like others of its genre, categorizes industries as primary or secondary and then establishes sectoral characteristics for each of these markets. The supply approach, on the other hand, tends to employ dualism as an analytical tool for understanding occupational and income attainment. Particular emphasis, here, has been placed on race and, more recently, on sex differences. For a recent example of the latter type of study, see Monica Boyd and Elizabeth Humphreys, "Sex Differences in Canada: Incomes and Labour Markets," in *Reflections on Canadian Incomes*, selected papers presented at the Conference on Canadian Incomes sponsored by the Economic Council of Canada (Hull: Supply and Services Canada, 1980).

4 This argument is presented in some detail in Raymond Loveridge and Albert Mok, "Theoretical Approaches to Segmented Labour Markets," *International Journal of Social Economics*, 7, no. 7 (1980): 376-411.

5 For office workers, the average establishment turnover rates for the Type A and Type B sub-samples were 15.4 per cent and 10.1 per cent, respectively. The corresponding figures for non-office workers were 27.8 per cent and 19.3 per cent.

6 Average collective bargaining coverage for Type A respondents was 5.6 per cent for office workers and 34.2 per cent for non-office employees. The Type B rates were 6.2 per cent and 32.2 per cent, respectively.

7 This is stated in various writings of both Piore and Doeringer. For more details, see Smith, *The Dual Labour Market Theory*, p. 7.

8 Loveridge and Mok, *Theoretical Approaches*, p. 407.

9 A more detailed discussion of the issues raised here can be found in Keith Newton, Gordon Betcherman, and Noah Meltz, "Diagnosing Labour Market Imbalances in Canada," *Canadian Public Policy*, 7, no. 1 (Winter 1981): 94-102.

10 See Norman Leckie, "Evidence of Skill Shortages in Canada," Economic Council of Canada (mimeograph), 1981.

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